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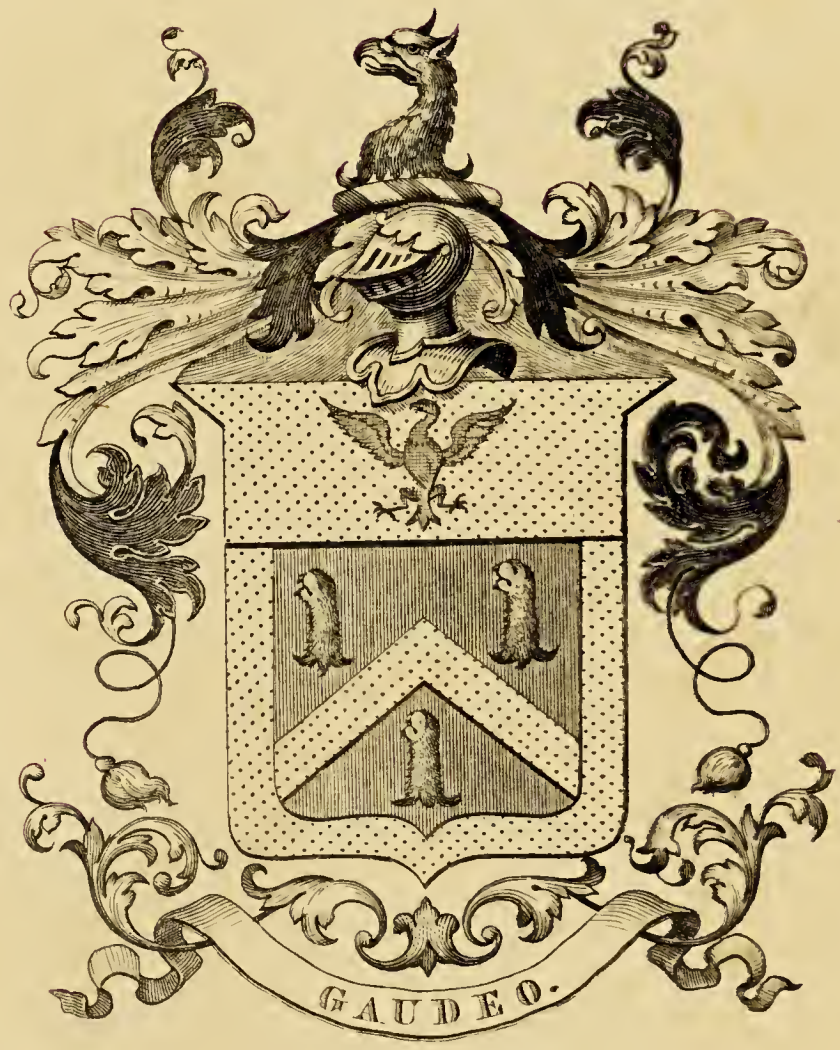

John Carter Brown.

A

TREATISE

ON THE

DELUGE.

CONTAINING

I. Remarks on the Lord Bishop of CLOGHER's Account of that Event.

II. A full Explanation of the Scripture History of it.

III. A Collection of all the Principal Heathen Accounts.

IV. Natural Proofs of the Deluge, deduced from a great Variety of Circumstances, on and in the terraqueous Globe.

AND,

Under the foregoing General ARTICLES, the following *Particulars* will be occasionally discussed and proved, *viz.*

The *Time* when, and the *Manner* how *America* was first peopled.—The *Mosaic Account* of the *Deluge* written by *Inspiration*.—The Certainty of an *Abyss of Water* within the Earth.—The Reality of an *inner Globe* or *central Nucleus*.—The Cause of the *subterranean Vapour*, and of *Earthquakes*.—The Origin of *Springs*, *Lakes*, &c.—The Formation of *Mountains*, *Hills*, *Dales*, *Vallies*, &c.—The Means by which the *Bed of the Ocean* was formed.—The Cause of *Caverns* or *natural Grottos*; with a Description of the most remarkable, especially those in *England*.—Also an Explication of several lesser Phænomena in Nature.

Illustrated with two COPPER PLATES; one, representing the State of the Earth during the Height of the Flood; the other, the State of the Earth as it is at present.

By ALEXANDER CATCOTT, A.M.
Vicar of *Temple* in *Bristol*.

—— Antiquam exquirite matrem. VIRGIL.

The SECOND EDITION, considerably enlarged.

LONDON,
Printed for the AUTHOR, by E. ALLEN, in *Bolt-Court*; and Sold by B. WHITE, at *Horace's-Head*, in *Fleet-Street*.

M.DCC.LXVIII.

RPJCB

To the Right Honorable

DAVID STUART ERSKINE,

Earl of BUCHAN,

Baron *Auchterhouſe, Glendovachy, Cardroſs,* &c.

Doctor of Laws of *Glaſgow, St. Andrew's, King's,* and *Mariſchal Univerſities* of *Aberdeen*; Doctor of Medicine of *Edinburgh*; *Fellow* of the *Royal* and *Antiquary Societies* of *London*, of the *Philoſophical Society* at *Edinburgh*, and the *Literary* at *Glaſgow* ——

A Nobleman, who is not aſhamed, in a depraved and degenerated Period of Society, to own the Holy Scriptures as the only Sources of irrefragable Truths, and not only conſiſtent, but demonſtrative, with reſpect to the Philoſophical Syſtem of the Univerſe in general, and of this Earth in particular — This VOLUME is dedicated

By his Lordſhip's

much obliged

and obedient humble Servant and Chaplain,

Briſtol, Auguſt 1, 1768.

A. CATCOTT.

PREFACE.

SOON *after the publication of the* first *edition of this work, I received ſeveral letters from gentlemen of character and note in the learned world for their knowledge of the ſubject therein treated. Some of theſe letters contained exceptions to particular poſitions in the tract, deſiring a farther explication and a fuller confirmation of them. In the preſent edition I have endeavoured to give a reply to ſuch requeſts, which I hope will be deemed ſatisfactory. Only one thing I muſt mention, that ſome of theſe requeſts aroſe from inattention to the manner in which the ſubject is treated; eſpecially where the proofs were not thought ſufficient for the points advanced. It may be proper therefore to adverti*ſe *the reader (though it is more conſpicuouſly pointed out in this than in the former edition) that the* evidence *on which this Tract is built is threefold*—Scripture—Heathen Hiſtory—*and* the Natural ſtate of the Earth. *So that where* one *of theſe may ſeem de-*

fective in proof, by the coalition of the other two the point may be clear and manifeſt; and in many places where the evidence was of a combined *or* mixed *nature, it was proper to drop part of it, that each ſpecies of proof might be diſpoſed under it's proper head. So that I hope for the future, no one will judge of any particular tenet 'till the* whole book *be carefully peruſed, and the evidence produced under* each general diviſion *for any point in queſtion be accurately examined. And that the reader may more eaſily do this, the* table of contents *is made ample and full; ſo that by caſting his eye over that, he may readily ſee where the whole evidence for any particular point is diſpoſed of. And to a perſon unacquainted with the ſubject it may not be amiſs, if he would peruſe* the table of contents *before he begins the work itſelf, as it will give him a* general idea *of the manner in which the ſubject is treated.*

Every man in this enlightened age (having been fully inſtructed by thoſe genteel and eaſy conveyances of knowledge, news-papers *and* magazines) *thinks he has liberty of making a* philoſophy *(and I might add indeed a* religion) *for himſelf, and not only this, but alſo a juſt right of telling his imaginary tale to all that come nigh him.* " *Hence it is that every village has it's wiſe-man, who dictates as philoſopher and divine, gains his circle of admirers, and like*

Cato,

Cato, *gives laws to his little ſenate.*" *But the reader muſt not be ſurprized, if the author of this tract has taken a different method, and inſtead of preſenting him with a ſyſtem out of his own head, has endeavoured to* explain *a* philoſophy *already* revealed. *It appeared to him extravagantly fooliſh, and even impious, for any man to preſume to give an account of the* origin of things—*the* deſtruction, diſſolution, *and* re-novation *of* any part of nature, *that happened long before himſelf was in being—unleſs enlightened and inſtructed by the Author of all things. He therefore had immediate recourſe to that book, which for ages has been allowed to be the* word of God, *and by examining the* works of nature, *found ſuch a ſurpriſingly-exact agreement between them, that they tallied like two indentures, ſo as to leave no doubt that the author of one was the inditer of the other. If the following ſheets ſhould contribute to eſtabliſh this truth in the mind of the reader, or any way tend to put a ſtop to thoſe numerous errors and fantaſtic notions at preſent prevailing amongſt us on the ſubject here diſcuſſed, —the view of the author in the publication will be ſatisfactorily anſwered.*

As the additions *to this ſecond edition are conſiderably large, I have printed them* ſeparately *from the work, that thoſe who have the firſt edition may*

purchaſe them, without being under the neceſſity of procuring the whole for the ſake of a part.

It may be proper alſo to inform the reader, that this volume is a diſtinct treatiſe of itſelf, at leaſt independent of the tract *on the* CREATION, *&c. (mentioned p.* 11.) *the few particulars in that, which were explicative of this, being inſerted in their proper places. Not but that if the reader ſhould be deſirous of ſeeing a* full account *of the* CREATION, *&c. or an* explanation *of the* firſt chapter of Geneſis *at large, together with a rectification of the miſtakes that have been uſually made in the interpretation of that chapter, he had better conſult that* Treatiſe itſelf.

N. B. *In ſubſtituting the* Roman *characters for the* Hebrew, *I have followed the method laid down by Dr.* Robertſon *in* his true and antient manner of reading Hebrew without points.

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A

TREATISE

ON THE

DELUGE.

PRELIMINARIES.

THE Knowledge of the *natural State of the Earth* is the *foundation* of *all true Philoſophy*.

If we are miſtaken in our judgments of Cauſes and Effects, relative to things that are within our reach, and on which we can make immediate obſervations and experiments, we ſhall certainly be ſo, with reſpect to Thoſe that are at a diſtance from us; and of which we can only reaſon by *Analogy*.

Now of all events that have happened to the Earth, there is none that has made a greater noiſe in the world, or has left ſuch evident marks of its Reality, as that of a *Flood of Waters*, in which the whole Globe was drowned.

AND if it can be proved, that the Earth has actually been thus covered by water, and totally diſſolved therein, ſuch an Event as this, I ſay, muſt have made many and great alterations in the before-ſtate of the Earth, and be the *Cauſe* of *many remarkable phænomena* in the *preſent*. And yet, I am ſorry to ſay it, philoſophers in general, who have endeavoured to explain the whole Syſtem of Nature, and many who have wrote in particular on the Subject of the *Earth*, have taken no notice of this great Event; and thereby have been led themſelves, and alſo have led others, into a variety of errors, by aſcribing Effects to very different Cauſes than the true.

I HOPE, therefore, that an Attempt to lay before the publick the *Evidence* that may be brought in proof of an UNIVERSAL DELUGE, and to exhibit a *diſplay* of all the *various Effects*, both *on* and *in* the Earth, that were owing to that *one Great Cauſe*, may not be uninſtructing, nor unentertaining.

THE *Evidence*, deducible for this great Event, may be ſaid to be *Threefold*.

FIRST, The *Scripture*.

SECONDLY, *Heathen Hiſtory*.

THIRDLY, The *Natural State of the Earth*.

BUT before I can enter on the diſcuſſion of either of theſe Particulars, it may be proper to premiſe a few articles. And

FIRST,

I.

FIRST, with regard to the *Scripture-Account* of the *Flood.*

THE *Moſaic* deſcription of the Deluge has been accounted by ſeveral to be *too ſhort* and conciſe, for the due relation of ſo important an event. But thoſe who make this objection ſeem not rightly to underſtand the nature of the caſe; the proper ſtating of which will ſerve for a full anſwer to the objection.

FIRST then, Let it be conſidered, that as at the time of the Deluge the Earth was deſtroyed, broken to pieces, reduced to its chaotic ſtate, or *unformed*, and afterwards *formed again*; and this, its *ſecond* Formation, anſwerable, both in the manner and means, to its *firſt* and original (for ſimilar expreſſions are uſed, and the ſame cauſes are mentioned to have been employed in both caſes) and as a deſcription had been given at large of the manner of the firſt formation in the *Moſaic* narrative of the Original of things; ſo it would be needleſs to have enlarged on that point, in the account of the Re-formation of the Earth at the Deluge; juſt mentioning the chief articles would be ſufficient, as every judicious reader would naturally recur to the firſt and fuller deſcription.

BESIDES; *Moſes* might explain to his Cotemporaries any particular part that might ſeem difficult or deficient; and the latter inſpired Penmen, ſo often referring to, and occaſionally explaining, the Moſaic Philoſophy, have left us in their writings, great aſſiſtance towards ſolving any difficulty. So that, if the whole, recorded in the Bible, reſpect-

ing the firſt formation of the earth, or its deſtruction and re-formation at the time of the Deluge (which is the ſame thing) were collected together, the account would appear ample and full, as will, in a great meaſure, be ſeen from the quotations of this kind occaſionally occuring in this Tract.

But farther ſtill; as many of the effects of the Deluge are legibly written in the book of Nature, being engraved in the deepeſt characters in the hardeſt rocks all over the earth; ſo thoſe, who would be at the pains to read this book, who *would go up as high as the hills, and down to the vallies beneath, and enter into the dark chambers of the earth* (carrying the divine light in their hands) ſhould find the ineſtimable treaſure, ſhould ſee that the world had been deſtroyed, and formed again, and in what manner this ſurpriſing tranſaction had been effected; and would by this means have full proof—that there is a God—who that God is—and that he governs the world. And they, who would not be at this pains (or liſten to thoſe that had been) did not deſerve this peculiar proof and knowledge. Sufficient be it for God, and even gracious muſt we eſteem it, that he informs us of ſuch and ſuch things in his Word, and gives us eyes to ſee the reſt or another part of the evidence in Nature: and they who will neglect either or both of theſe proofs, may deſervedly remain ſo far in ignorance. God indeed will do for us what we *cannot* do for ourſelves; but we muſt not expect that he will do what we *can* do: This would be to undo what himſelf had before done, or give us power on purpoſe

poſe to take it away, and give it us again; and would alſo be encouraging ſloth, idleneſs, and the diſuſe of our rational faculties. Therefore to ſpur up our abilities, and quicken our diligence, he gives us That whereon we *may reaſon*, and then juſtly leaves us *to reaſon*.

FROM what has been ſaid then, two points I think are manifeſt; firſt, the *ignorance* and *inexcuſableneſs* of thoſe, who have ſpoken againſt the *Moſaic* account of the Deluge as *imperfect* and *deficient*; ſecondly, how *unqualified* thoſe perſons muſt be to give a *true account* of the Deluge, that have *not examined Nature*, but ſat down at eaſe in their ſtudies, drew lines upon paper, &c. vainly imagining that the form and inclination of Rocks, courſes of Rivers, veins of Ore, and the ſituation of things in the ſolid earth, would ſhape and wind themſelves according to their fancies.

II.

ANOTHER article neceſſary to be ſettled, as preparatory to the ſubject I am to ſpeak of, is, *in what manner*, and *how far*, the Divine Interpoſition is to be allowed in the Miracle of the Noachian Deluge, or in deſtroying and re-forming the earth at that time. For as Natural Cauſes were made uſe of (though under the Supreme) I ſhall endeavour to explain it, ſo far, *philoſophically*; on which account I would obviate an objection, which an inattentive reader might make to ſuch kind of explanations, as tho' they *took away* or *leſſened* the *Divine Power* in the fact related. But I truſt, upon examination, we ſhall find, that this way of

explicating or unfolding Miracles, will manifeſt the *Wiſdom* and *Goodneſs*, as well as the *Power* of GOD, and in a manner too, far ſuperior to any other. When an *extraordinary effect* is performed, to tell a perſon—*that* GOD *did it*—and there reſt, without explaining the *end*, the *means*, and the *manner* of doing it, is loſing great part of the evidence of the miracle, and the intent for which it was performed; and is generally ſpoken as a cover for our ignorance, or rather our pride, which is piqued at a difficulty we cannot ſolve. But GOD is a GOD *of order*, and when things are done for the ſake of man, he adapts his operations to the ſtate and circumſtances of man.

Now it is an allowed truth, that the ſituation of man in this world is ſuch, that he is confined for his ideas (the foundation of his knowledge) to ſenſible or material objects; and it is alſo certain, that the prevailing *Idolatry*, both long before and long after the time of *Moſes*, even almoſt from the creation of man to the coming of *Chriſt*, was the worſhipping the *Natural Agents*, or ſome Part or other of the Syſtem of Nature, inſtead of GOD, the *Creator* and *Former of all*. [a] Such then being the ſtate of man, and ſuch the peculiar circumſtances of the former world, the moſt ſuitable method to *deſtroy this idolatry* would be, to *over-rule*,

[a] Deut. iv. 19. xvii. 3. 1 Kings xi. 5. 2 Kings xvii. 9. xxiii. 4, &c. 2 Chron. xiv. 3, 5. Job xxxi. 26—29. Jerem. vii. 9, 18. viii. 1, &c. xix. 4, 5, 13. xxxii. xliv. Ezek. viii. 15, 16. xxiii. 30, 37. Wiſd. xiii. 1—4.

The Writings of the *Greeks* and *Romans* abundantly teſtify the ſame, as ſeveral Authors have ſhewn at large; particularly *Parker* in his *Tentamina Phyſico-theologica de Deo.*

ſuſpend,

ſuſpend, or *divert* the *common courſe* of the *Natural Agents*; which would undeniably prove, that they had a *Superior*, one who *could turn them, whitherſoever he pleaſed.* And when ſuch an act was performed, the *part of man* would be, to diſcover the *propriety* of the *Agent* or *Agents*, overruled or ſuſpended, on *particular* occaſions; and trace out how appoſitely the *Means* conduced to the *End.*

I SHALL illuſtrate and exemplify my meaning from that publick and grand diſpute between JEHOVAH and *Baal*, under the conduct of *Elijah* and *Baal's prophets*, recorded 1 *Kings* xviii. which the reader is deſired to peruſe. The Conteſt here was concerning the *true* GOD, whether JEHOVAH or *Baal*, or rather who was the *Ruler* (for that is the meaning of the word *Baal* in the Original) the *material Heavens* or *Agents*, or *any Being* above them. JEHOVAH had already ſhewn himſelf ſuperior to the *Heavens* (at leaſt, to every unprejudiced mind) by having *ſuſpended* their *power* or *action* in *giving dew* or *rain* for above *three years*; (ſee 1 *Kings* xvii. & xviii. *Luke* iv. 25.) but *Baal*'s followers regarded not this; for all that time *they eat at the royal* [*Jezebel*'s] *table*, and lived in plenty; verifying a common obſervation, that as long as men have enough of this world, they are not apt to be very ſolicitous about the *Governor* thereof. But the famine increaſing more and more, the king and his ſervants are obliged to go from home, and ſeek in different places for food for themſelves and cattle; and GOD at laſt, out of compaſſion to his people, ſends *Elijah* to meet the

king, and have the conteſt decided at once. That *Elijah*'s GOD had power over the *Water of Heaven*, was pretty plain; he now proceeds further, and will ſhew, that he has power over its oppoſite, the *Fire*, and can make it act or ceaſe from acting juſt as he pleaſes; and from *Jerem.* xix. 5. it is evident that *Fire* (which is the moſt powerful operation of the Heavens or Air) was eſteemed ſacred to *Baal*,—*they have alſo built the high-places of* Baal, *to burn their ſons with fire for burnt-offerings unto* Baal. The Teſt, agreed to on both ſides then was—that *the* GOD *which anſwereth by fire, and conſumeth the offered victim, He ſhould be* GOD: and if *Baal* could anſwer by any thing, it certainly muſt be by *one* of his *own emblems*. The place choſen for the ſcene of action was *Mount Carmel*, which probably theſe idolaters had made an *high-place of* to *Baal*; ſince we are told, *they had broken down the altar of* JEHOVAH *that was there*. Thus *Elijah* grants them every favourable circumſtance. And when they had called upon their God *from morning even until noon* (when the *Heat*, the *greateſt power* of the day, was come) and in their furious fits of madneſs and deſpair had *leapt upon their altar, and cut themſelves with knives and lancets*; but *neither voice came, nor any to anſwer, nor any that regarded*:—then *Elijah* repaired the altar of the LORD, and laid thereon a ſacrifice; and to ſhew the mighty power of GOD, ordered a great quantity of *water* to be *poured* on the *ſacrifice* and the *altar*, ſo as *to fill a trench* that was drawn round about it; and by this means render the ſacrifice *leſs ſuſ-*

ceptible

ceptible of the action of *Fire*; and take off all poſſible ſuſpicion of deceit. All things thus prepared, *Elijah* invokes his GOD to give the deciſive proof of his Deity; and immediately, at his requeſt, *Fire ſtreams down from heaven, conſumes the offered victim, and licks up all the water in the trench.* At which *ſtriking, viſible manifeſtation* of the *Superiority* of *Elijah*'s GOD, *all the people fell on their faces, and cried out*, JEHOVAH, *He is* GOD; JEHOVAH, *He is* GOD. And a greater proof of Divine Interpoſition could not be deſired, nor one more applicable to the purpoſe be given. Here the Heavens were made—in a *particular place*, at an *appointed time*, in an *intereſting diſpute*—to exhibit their ſtrongeſt operation, *Fire*, and pour it down in honour of a ſacrifice dedicated to JEHOVAH, and were with-held from doing the ſame on a ſacrifice dedicated to themſelves: and ſo themſelves in fact forced to confeſs their own inability, bring confuſion on their own votaries, and give glory to the true GOD.

SUCH alſo was the caſe at the Deluge. The grand object of falſe worſhip then was the *Natural Agents*, or *ſome part* or *other* of *the Syſtem of Nature*, as thoſe words of GOD, *Gen.* vi. 17. (the prelude to that dreadful cataſtrophe) indicate: *And behold, I, even I, do bring a flood of waters*, &c. 'It is not ſaid, *Let there be*, or *let the* 'Agents which I have eſtabliſhed, or *let us bring*; 'but *I, even I*, in direct oppoſition to all the 'Laws of Nature, or powers eſtabliſhed in Mat-'ter.' But the *means* uſed in, and the *manner* of, the

the execution declare this plainer. As the *Corruption* of mankind before the flood was remarkably great, and the *Imagination of their heart only evil continually*, it could not well be in ſuch a *general Apoſtacy*, but that many objects of falſe worſhip would be ſet up; ſome imagining one part, others another part of *Nature*, to be *Supreme*. But from the manner of their puniſhment the three *principal Deities* ſeem to have been, the *Air*, the *Water*, and the *Earth*: the firſt, the heathen *Jupiter*; the ſecond, *Neptune*; the third, *Terra*. Accordingly GOD, to defeat this idolatry, and manifeſt his power over Matter, inverted the order and natural State of Theſe in particular; he made the *Air* to deſcend into the place of the Water, that lay beneath the earth, and the *Water* to occupy the place of the air, and by the paſſing and repaſſing of theſe two agents thro' the *Earth*, the ſhell or orb thereof would be torn to pieces, its ſolid form reduced to fluid (of each of which effects more explicitly hereafter) and all the *idolatrous inhabitants* deſtroyed by the *very Means* or *Agents* they depended on for ſuccour. Thus the *true* GOD demonſtrated his power over *Matter*; and tho' he made uſe of *material Means*, yet the Act was undeniably *ſupernatural*, above all the laws and powers of nature. The Natural Agents *could not*, or if they could, they certainly *would not*, have overturned their *own* empire, puniſhed their *own* votaries, and ſuffered *themſelves* to be made the *inſtruments* of puniſhing them. This *manner* of *working miracles* is eminently ſtriking, and indeed irreſiſtible; as it affords man *ſenſible*

ſible and *material evidence*, is *level* to the *conception of all*, and was *peculiarly adapted* to *the ſtate of the world*, when ſuch kind of miracles were wrought.

III.

SOME years ago I printed a Treatiſe, intitled, REMARKS *on the Lord Biſhop of Clogher's* EXPLANATION *of the* MOSAIC HISTORY *of the* CREATION *and* FORMATION *of this World*, &c. and intended this Tract ſhould have followed ſoon after as a kind of *ſecond Part*; but before I could quite finiſh it, I was ſeized with an illneſs, which affected my ſight in ſuch a manner, that I was obliged to lay aſide all thoughts of proſecuting the Subject for three or four years, and in the mean time his Lordſhip of *Clogher* died; on which account I ſhall, in a great meaſure, drop the controverſial part in this Treatiſe, ſelecting only one or two of the moſt exceptionable parts of our Author's account of the Flood, examine them, and have a principal regard to them in explaining that event. I hope alſo to lay down ſuch a clear and full deſcription of the Deluge, that any one by comparing his Lordſhip's tract with this, may determine for himſelf where the truth lies.

THE chief exceptions I have to his *Lordſhip's account* of the *Flood* relate to the *Extent* of it; firſt with reſpect to the *inhabitants* of the earth; ſecondly, with regard to the *Earth itſelf*, or its *ſolid, metallic*, and *mineral part*. In each of theſe points he is of opinion, that the *effects* of the *Deluge* were *not univerſal*, but only *partial*.

'AND therefore (ſays he, p. 171, concerning

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'the firſt) altho' I look upon that part of this
'[ſcripture] narration, relating to the *deſtruction*
'of *mankind*, and of *birds*, and of *beaſts*, at the
'Deluge, to be *literally true*, in reſpect ONLY of
'*that part* of the world, in which *Noah* lived
'before the flood, and which was afterwards
'peopled by his three ſons, *Shem*, *Ham*, and *Ja-*
'*phet*, yet I cannot but acknowledge that this
'Deluge, which happened in the time of *Noah*,
'muſt have been *general* in *ſome* degree; as ma-
'nifeſtly appears from the general elevation of
'mountains over the whole world, and from the
'immenſe quantity of ſea-ſhells, which are fre-
'quently found in the moſt diſtant regions of the
'earth. Nevertheleſs I cannot but ſuppoſe, that
'*other parts* of the then habitable world, which
'by the force of the Deluge were ſeparated into
'iſlands, and were divided from the continent
'whereon the ark landed, were in ſome ſort ex-
'empted from the common calamity, brought
'upon the reſt of the world by the Deluge; in-
'aſmuch as the *Continent* of *America*, and *many*
'*iſlands* in the *Eaſt-Indies*, are at preſent partly
'inhabited by wild beaſts and noxious animals,
'which it is not reaſonable to imagine, that any
'body could, or would, have imported thither
'ſince that time. Therefore, I own, I cannot ſee
'any other probable ſolution of this difficulty, than
'to ſuppoſe them protected by the Providence of
'GOD from the general deſtruction, in ſome ex-
'traordinary manner, for the propagation of their
'own ſpecies.'

WHICH paſſage, I humbly apprehend, is ſcarce
conſiſtent

conſiſtent with itſelf; at leaſt the poſition, that is laid down therein, will not coincide with other parts of the author's treatiſe; and is contrary to Scripture and Reaſon. His Lordſhip ſeems to forget, that, according to his Syſtem, but a very ſmall part of the world was, or indeed poſſibly could be, inhabited before the flood, viz. that tract of land only which lay between the *Northern Tropic* and the *Arctic Circle* (ſee of his Treatiſe, p. 74, 75.) there being a great 'belt *of water* under the 'equator (equal in extent to the ſpace between 'the two Tropics; ſee PLATE 3d.) which ſe-'parated one part of the earth from the other; 'ſo that only one of the *Hemiſpheres* [if the above-'mentioned *tract* could be properly called an '*hemiſphere*] was the ſeat of the habitation of the 'ſons of *Adam* before the Deluge, p. 65, 75.' If ſuch was the ſituation of mankind before the flood, had even the far greater part of *America* been exempted from the effects of the deluge, no inhabitants of the former world would have been ſaved on it; much leſs could any have been ſaved by exempting the *Iſlands* of the *Eaſt-Indies* from that deſtruction; becauſe they lay either *directly under*, or *quite* on *the other ſide* of the aforeſaid great *belt of waters*; and ſo could not poſſibly have been inhabited before the flood. Beſides; as according to his Lordſhip the falling down of this great belt of waters, or 'their ruſhing from 'under the equator [the higher ground] towards 'the poles' [the lower] (p. 155.) was one great cauſe of the deluge, ſo it could not but be, that ſuch a violent efflux of water, running in this direction, would drive all the then inhabitants of the

world

world towards the Northern Pole; where, if they arrived, they muſt, according to himſelf, 'have 'periſhed on account of the Cold.' Nay, what is more, he aſſerts, that the waters thus ruſhing from under the equator 'would return to their 'natural and *original* ſituation of *over-ſpreading* 'the *whole earth*,' p. 155, in the manner they did on the *firſt day* of the Formation, before the *leaſt ſpot* of *Dry-land* had appeared. Now how we can reaſonably allow, that any perſons, in ſuch an *univerſal flood* as this, could eſcape being drowned, I cannot conceive.

But even let us ſuppoſe, that ſome of them were expert ſwimmers, and could live a long time in the water, yet according to our author's *further* deſcription of the deluge, they certainly could not be able to weather out the whole ſtorm, for thus dreadful was it, 'When the *fountains of* 'the *great Abyſs were broken up*, and an immenſe 'hollow was excavated out of the earth from 'pole to pole, as a bed for the ſea to lye in; 'when the rocks, and the ſands, and the ſhells, 'and the earth, that were taken thereout, were 'thrown upon the land, and raiſed in mountain 'upon mountain, ſo as to aſſail the ſkies, and 'invade the region of the clouds: And when 'this heterogeneous mixture was *ſhowered down* 'again upon the earth, it did not only *rain*, but 'the water, and ſand, and earth, and rock, and 'ſhells, were poured down *in cataracts* from 'heaven, for *forty days*, over the *face* of the *whole* 'earth,' p. 88, 153, 118. Surely in ſuch a terrible ſtorm as this, neither the leaſt, nor the greateſt,

greateſt, nor the ſtrongeſt animal, could eſcape being daſhed to pieces, much leſs a poor, deſtitute, affrighted, naked man: So that it muſt have required a *miracle*, far *greater* than That by which *Noah* and his family were ſaved, to have preſerved *one ſuch* perſon. And ſince God took ſo much care, and allowed ſo much time, for the preſervation of a *few juſt* ſouls, we cannot imagine, that he would ſuffer, by a *more extraordinary miracle*, a number of *wicked* to ſurvive; for *whoſe ſake*, and purpoſely to *deſtroy whom*, he brought the deluge upon the world, and put even the *righteous* to a ſevere trial of their faith in and dependence on him. This certainly is contrary both to Scripture and Reaſon; as will be ſhewn more fully hereafter.

But his Lordſhip imagines, that the *Text* will authoriſe his ſuppoſing that *ſome* did eſcape; which therefore muſt be examined. He ſays, that the writers of Scripture 'frequently put the *whole* for 'the *greateſt part*,' p. 168. and would therefore conclude, that the words *All* and *Every* uſed in the account of the flood, as '*All fleſh died*, and '*Every living ſubſtance was deſtroyed*, &c. ought 'to be underſtood with certain limitations,' p. 170. and therefore we may ſuppoſe, that *All* were not deſtroyed. That the words *All* and *Every* are ſometimes uſed in the Scripture to ſignify an *integral part*, is very certain; and I believe, there is no language in which they, or ſynonimous terms, are not ſo uſed. Since they are words which occur ſo often, and in ſuch a variety of ſenſes, it would have required much circumlocu-

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tion to have defined, in every inſtance, their preciſe meaning; the Context therefore is always left to determine that point. Now, the ſenſe, in which theſe words are uſed in the Scripture-account of the Deluge, is ſo fixed and determined, that it cannot poſſibly be miſtaken. *Moſes* ſays, (*after* he had related, that the *waters of the flood* had riſen to ſuch a height, as to have *covered All the high hills under the whole heaven*) *And* ALL FLESH *died, that moved upon the earth, both of* FOWL, *and of* CATTLE, *and of* BEASTS, *and of* EVERY CREEPING THING *that creepeth upon the earth, and* EVERY MAN. *All in whoſe noſtrils was the breath of life, of all that was* in the dry land, *died. And every living ſubſtance was deſtroyed which was* upon the face of the ground, *both* man, *and* cattle, *and* creeping things, *and* the fowl of the heaven; *and they were deſtroyed from the earth*; *and* NOAH ONLY *remained alive, and* THEY *that were with him in the ark*, Gen. vii. 21. Had *Moſes* intended to declare, that *every individual living creature* that was *upon the Earth*, before and during the flood, was *deſtroyed* by *the flood*, he could not have been more expreſs and particular; he ſays, that *every living ſubſtance*, both *man*, and *cattle*, and *creeping thing*, and *fowl of the air*, that was *upon the face of the ground*, or *in the dry land, died*; and we know of but *one ark* which *went upon the face of the waters*, and ſo ſaved the *men* and the *animals* therein: of courſe, according to the *Scripture-account*, there was no *living creature* upon *the face of the whole earth*, but what *periſhed* by the flood.

AND

AND what ſhews this plainer is, that thoſe, whom we know were exempted from *this*, otherwiſe, *univerſal deſtruction*, are expreſsly mentioned to have been ſaved; and their preſervation mentioned too in *ſuch* a manner as to ſpecify, that *no other perſons* or *creatures* were ſaved, *and* NOAH ONLY *remained alive, and* THEY *that were with him in the ark.* Nay, St. *Peter* deſcribes this affair ſtill more circumſtantially, and fixes the very *number* that were delivered, 1 *Epiſt.* iii. 20. *wherein* [i. e. *in the ark*] FEW, *that is*, EIGHT *ſouls, were ſaved by water*; and again, 2[d] *Epiſt.* ii. 5. GOD *ſpared not the old world, but ſaved* NOAH *the* EIGHTH *perſon* [*who* with *his own wife*, his *three* ſons, and their *three* wives, was juſt the *eighth* perſon] *bringing in the flood upon the* WORLD *of the* UNGODLY. *All the ungodly* therefore muſt have periſhed. So that the words *all* and *every* in the above paſſages muſt be taken in the *largeſt latitude*, and extended to the *utmoſt univerſality*, with regard to the *wicked.*

I MAY juſt add too, (for as many have urged *the above objection* againſt the *Univerſality of the Flood*, ſo I would willingly remove it by every means without being tedious) that *each* of the arguments, which will be hereafter brought, eſpecially *thoſe* from Scripture, in proof of the *Univerſality of the Deluge*, will ſhew alſo, that the words *all* and *every* are to be underſtood in the ſenſe I contend for; becauſe *Scripture* (as GOD was its author) muſt be conſiſtent with *Itſelf*, and with *Truth.*

HIS Lordſhip's *difficulty* concerning *the peopling*

of

of America I propoſe to give an eaſy ſolution to hereafter, obſerving here by the by, that whether we could get over this difficulty or not, it would not invalidate the above arguing; which depends entirely upon the ſenſe of Scripture, and which may be corroborated by many proofs from the natural ſtate of the earth; and where theſe two concur to offer clear, expreſs, and united evidence, there no event in nature, which may appear unaccountable to ſome, but may be eaſily accounted for by others, ought to ſet aſide their ſuperior authority.

THE other article which I am to conſider, is our Author's ſuppoſition (p. 135.) that *only* the *upper ſurface* of the earth was *diſturbed* or *deſtroyed* at the Deluge. For, 'He does not ſuppoſe 'with Dr. *Woodward*, that the whole material 'world was, at the time of the deluge, reduced 'into a *ſoft pulp*, but allows that every thing 'continued in its *then ſtate* of *ſolidity*.' And yet, he ſays, 'it muſt be acknowledged, that at the 'time of the breaking up of the fountains of the 'Abyſs, a great part of the materials, which 'were ſcooped out of the earth, as well as thoſe 'which then lay on the ſurface of the ſand and 'of the ſhore, would be looſe, ſeparate, and 'divided, and would float irregularly in that 'confuſion of elements, which ſuch a wonderful 'operation muſt have occaſioned, not only when 'ſhowered down in cataracts from on high, but 'alſo, when conveyed by the force of the waters 'of the ſea, which guſhed forth, as out of a

'womb,

'womb, to the place deſtined for their abode,' p. 118.

So that, if I rightly underſtand his Lordſhip, his opinion is, that the *upper parts* of the earth only were moved at the flood; and theſe irregularly thrown about by the waters of the deluge, in large, looſe, or detached, *ſolid maſſes*; but were *not diſſolved* or reduced to their original atoms; much leſs were the *ſtrata*, that lay beneath the places from whence theſe parts were torn: for thus he ſays, p. 140. (where ſpeaking of part of a ſkeleton of an elephant, and of ſeveral horns of the mooſe-deer, that were found foſſil in *Ireland*)

'It likewiſe hence appears, that ſome of the *low* 'grounds in *Ireland* have not been covered more 'than from *five* or *ten* feet thick with the *Slutch* 'of the deluge;—ſince it is not probable, that at 'the time of the death of the afore-mentioned 'elephant and mooſe-deer, the places upon which 'they were found lying, were the *natural ſurface* 'of the *then habitable* earth; or, as it is more 'clearly expreſſed, p. 104. *where* we may ſuppoſe 'the *ſurface* of this earth was, when there were 'no mountains, but all this world was an uni-'form globe, covered with water (as at the crea-'tion) there the *ſtrata* are *uniform*; and the *ſeve-'ral layers* of them, whether ſand, clay, mine-'rals, or gravel, are diſpoſed in an *horizontal po-'ſition*, parallel to one another.'

This laſt obſervation (which is the only proof brought for his Lordſhip's opinion, and is laid down upon the authority of *Monſieur Buffon*) is certainly falſe in fact; as I will venture to affirm,

every one will find, that will but make ten obſervations upon the regular ſtrata of the earth, in ten different places; it being far more common to find the ſtrata, which lye beneath the ſlutch and rubble left by the waters of the deluge, upon the ſurface of the earth, *inclined* in *various directions*, rather than *horizontally diſpoſed*; which muſt undeniably prove that *ſuch ſtrata* have been *moved* or *diſplaced*, and of courſe, that the effects of the deluge reached *below* what is called by ſome, the *faſt-ground*, or what our Author imagines to have been the *ſurface* of the Earth *before* the flood. And I dare ſay, if he will have the earth opened in the places where the above mentioned horns of the mooſe-deer, &c. were found, deeper than ten feet, he will diſcover as many infallible marks of the deluge, as the horns, &c. of the aforeſaid animals; ſuch, for inſtance, as ſea-ſhells, teeth and bones of other animals, or plants, &c. At leaſt ſuch are frequently found in *England*, beneath what is commonly called *Slutch*; and I ſuppoſe *Ireland* was not more favoured during the deluge than *England*.

In ſhort, what is called *Slutch*, is no more (as I obſerved before) than that matter, which the waters, in their retreat from the earth at the end of the deluge, left on places fit to receive it, as the *flats* on the ſides of mountains, the bottoms of *dales*, *vallies*, &c. as the ſubſtance of which this matter conſiſts, and the manner in which it lies, evidently prove; it being generally of a mixed nature, conſiſting of various ſubſtances—and lying, not in regular ſtrata, as ſtone, chalk, &c.

do, but in ſmall ſeams or ſtreaks, of unequal breadth in different parts, and in a train, juſt as the laſt ſediment of water would naturally leave it.

So that it is no wonder his Lordſhip cannot be of opinion that *all the metallic* and *mineral matter* of the earth *was diſſolved* or *ſeparated and reduced to its original atoms* at the Deluge, when it does not appear from his obſervations, that he *ever examined* the *earth* below *ten feet*, but judged of the *effects* of the Deluge upon the *whole body* of the earth, from what was tranſacted *only*, and that *very weakly*, on the *ſuperficial part*. But I hope to make it evident, both from *ſcripture* and *nature*, that *all the ſtrata of ſtone*, *coal*, *chalk*, *&c.* and *all the veins of ore* in the *antediluvian earth*, were *actually diſſolved*, their conſtituent corpuſcles ſeparated one from another, and when in this ſtate of ſeparation, were mixed with a large quantity of water, ſo that the whole was reduced to a *fluid colluvies*. But of this in its due place and order.

AN

EXPLANATION

OF THE

SCRIPTURE-HISTORY

OF THE

DELUGE.

PART I.

HAVING ſettled ſome neceſſary Preliminaries, I ſhall now endeavour to lay before the reader a plain and full Account of the *Scripture-Hiſtory of the Flood.*

I BEGIN with *Gen.* vi. 13. *And God ſaid unto Noah, The end of all fleſh is come before me: for the earth is filled with violence thro' them: and behold I will deſtroy* THEM *with the* EARTH. So that the *Earth itſelf*, as well as *its inhabitants*, was to be *deſtroyed*. *The Earth*, as we are told before, *was corrupt before God*; its *primitive goodneſs* and *fertility* had been abuſed and perverted by

by man, and inſtead of rendering him more dependent on and thankful to his Creator, cauſed him to aſſume independency, and even to deify the earth, the immediate producer of its fruits, and to forget GOD the *original Author* and *Former of all.* [b] So that GOD (in judgment always remembering mercy) determines to deſtroy by a flood of waters the *Earth that then was*, retrench its luxuriancy, and ſo take away the cauſe of the general corruption; that thus by altering the ſtate of the earth, he might neceſſitate man to a greater degree of labour, ſhorten the period of human life, and demonſtrate to the future race of men, their real weakneſs and abſolute dependence on Him.

AND hence appears the neceſſity for the *deſtruction* of the *whole* globe. So that the opinion of

[b] Gen. vi. 12. *And* GOD *looked upon the earth, and behold it was corrupt; for all fleſh had corrupted* HIS WAY *upon the earth*, i. e. GOD's *way*; for *their own way* was *corrupt* enough; and they could not properly be ſaid to have corrupted *That*. *Noah*, we find, was exempted from the general deſtruction, becauſe (*Gen.* vi. 9.) *he walked with* GOD, *i. e.* he *went* in the *true way*, obſerved the precepts of the true religion, or *did not depart from his* GOD, CHRIST, (who is ſtiled THE WAY, *John* xiv. 6. and is the LIVING WAY, *Heb.* x. 20.) But all thoſe *who do depart*, and ſet up other gods, other ſaviours, new protectors, of *what kind* or *ſort ſoever*, are termed *Idolaters*, *Apoſtates*, *Imaginers*, *Corrupters of the way*, &c. and ſuch will be guilty of every *evil work* as well as *thought*; for as their perverted thoughts or imaginations lead the way, ſo bad practice will of courſe enſue. '*Corrupting*, (ſays *Ainſworth* on the 'place) is in ſpecial applied to *Idolatry*, and *depraving* of GOD's 'true ſervice, *Exod.* xxxii. 7. *Deut.* xxxii. 5. *Judg.* ii. 19. as, the 'people are ſaid to *do corruptly*, 2 *Chron.* xxvii. 2. when *they ſa-*'*crificed and burnt incenſe in the high-places*, 2 Kings xv. 35. So '*Idolatry* was their chief *corruption* here, as may alſo be gathered 'by *Gen.* iv. 26. ſee the *Annotations* there.'

of thoſe who have carried a *partial flood* to the *greateſt* extent, and allowed that *all mankind*, except thoſe in the ark, were deſtroyed—imagining that *mankind* inhabited only a large *part* of the world, but the *brute animals* the *whole*; and that the deluge did not reach beyond the parts inhabited by *man* (for *whoſe ſake alone* they ſuppoſe the flood to have been brought upon the earth) ſo that the *parts* inhabited by *beaſts* only, as the Continent of *America*, &c. were exempted from the deſtruction, and the animals thereon preſerved alive (by which they think they get over one difficulty, *viz.* the *repleniſhing the earth* with *animals* after the flood)—even this opinion, I ſay, will not ſtand the teſt of the Scripture-account; for the Deluge, we ſee, was not aimed ſolely at the *inhabitants* of the earth, but included alſo the *earth itſelf*.

HAD *Man* been the *only intended object* of *deſtruction*, there were many ways to take him off; there was the *Famine*, the *Sword*, the *Peſtilence*, *Fire*, *Wind*, and *Storm*, at the *word* or *command* of GOD; and either of theſe might have been employed, without *unhinging the whole frame* of the earth, and *diſſolving* all the *ſolid ſtrata* thereof. But this laſt method was intended, was threatned, was executed, was neceſſary; and therefore the *Deluge* was UNIVERSAL.

I PROCEED with the Scripture-account, *ver.* 14. *Make thee an ark of gopher-wood; (rooms ſhalt thou make in the ark) and ſhalt pitch it within and without with pitch. And this is the faſhion which thou ſhalt make it of; the length of the ark ſhall*

be

be three hundred cubits, the breadth of it fifty cubits, and the height of it thirty cubits: (a window ſhalt thou make to the ark[c]*) and in a cubit ſhalt thou*

[c] I have included this ſentence, together with one juſt before, and another almoſt immediately following, in parentheſes, as the ſenſe of the Context requires, and the Original fully juſtifies: for the word *it* in the next ſentence, viz. *in a cubit ſhalt thou finiſh* it *above*, plainly refers to the *Ark*, not to the *Window*; ſince the relative *it* is in the feminine gender, and the word for *Ark* in the feminine alſo, but the word for *Window* is in the maſculine; ſo the ſentence where That is, muſt be taken ſeparately from the reſt, or included in a parentheſis. And the ſenſe is, *In a cubit thou ſhalt finiſh* it (the *Ark*) *above*, that is, the top part of the roof of the *Ark* was to be made a cubit high in the middle, and ſloping on each ſide; on purpoſe, I ſuppoſe, that the rain and moiſture, which might fall during the Deluge, ſhould eaſily ſlide off, without damaging the Ark.

As Commentators have been much puzzled concerning what *this Window in the Ark* was, and I know but one Author that has properly explained it, and ſince his treatiſe is ſcarce, (*viz.* DICKINSONI *Phyſica vetus & vera*) I ſhall lay down, and endeavour to prove the certainty of his explication.——The common opinion is, that *this Window* was a *Hole in the upper part of the Ark* about *a cubit ſquare*, or *a cubit in height*; but how ſuch a cavity as this could poſſibly afford *light* to the *three ſtories* of the ark (one of which was doubtleſs under water) and to all the *ſeparate partitions* in thoſe ſtories, and to the *many paſſages* leading to thoſe partitions, and this during the *night*, at leaſt *ſome part* of the night, as well as in the *day*, is altogether inconceivable: ſo that this opinion, I think, cannot be true. But 2dly. the foundation on which it is built, *viz.* thoſe words, *In a cubit thou ſhalt finiſh it above*, refer, as I have already ſhewn, to the *Ark*, and not to the *Window*. So that 3dly. let the reader remember, there is no *preciſe outward form* aſcribed to this Window. And 4thly. what is tranſlated, *A window thou ſhalt make* TO THE ARK, if render'd according to the Original, is, *for*, or *for the uſe of the ark*, LaTaBE; ſo that a *window*, in the *common acceptation* of the *word*, can ſcarcely be the meaning of the inſpired writer.—5thly. The word JER (tranſlated *window*) properly denotes *a clear light*, and as IJER, ſignifying *oil*, comes from the ſame root, and both are derived from a verb ſignifying to *ſhine bright*, ſo the command here given to *Noah*, in all probability was, to make a *clear ſhining ſubſtance*, or a *bright oleaginous matter*, *for the uſe of the Ark*. Now ſuch would certainly be of great ſervice

thou finiſh it above; (and the door of the ark ſhalt thou ſet in the ſide thereof,) with lower, ſecond, and third

vice by affording light to every ſeparate room, ſince it might be hung up in *ſmall veſſels*, or otherwiſe, as the circumſtances of *time* and *place* required: This ſubſtance too might be of ſuch a *ſalutiferous nature*, or ſend forth ſuch vivifying rays, as would greatly conduce to the *health* of the *animals* in the Ark. That it is poſſible to make ſuch a *ſelf-ſhining matter*, either *liquid* or *ſolid*, the *hermetical Phoſphor* of *Balduinus*, the *aerial* and *glacial Noctiluca* of Mr. *Boyle*, and the *Pantarba* of *Jarchus*, (which laſt 'ſhone 'in the day, as fire, and at night emited a flame or light, as 'bright as day, tho' not altogether ſo ſtrong') and many other preparations of the like ſort ſufficiently evince (ſee *Stackhouſe's Hiſtory of the Bible*, Vol. I. p. 130.); and that it might have been, or that many have been, of the above ſuppoſed *ſalutiferous nature*, *Widenfield*, in his ſecond Book *de Medicamentis*, has plainly ſhew'd. And by the command here given to *Noah*, without any particular directions about preparing this ſubſtance, we may fairly collect, that he well knew of *what*, and *in what manner*, to make it.—6thly. The *Jewiſh Rabbies* ſeem to have had ſome notion of the true meaning of the word under conſideration, by ſuppoſing, that it denoted a *large bright Carbuncle*, or *precious ſtone*, which *Noah* hung up in the middle of the Ark, to give light all around; but this certainly would not wholly anſwer the end, for ſuch a ſtone (ſuppoſing there was ſuch) could not emit light into every ſeparate partition, and all the paſſages leading to the partitions, &c. ſo that ſome ſuch *ſhining ſubſtance*, as the above, which might be carried in the hand from place to place, or hung up, or, &c. was certainly neceſſary and intended.—7thly. The *Chaldee* Paraphraſe renders the *word* for *window* by one ſignifying ſimply *light*.—8thly. The *Septuagint* Tranſlators (probably not knowing any word in the *Greek* that would anſwer to the *Hebrew* JER) have omitted, or elſe have ſubſtituted a verb (επισυναγων) for it, which conveys neither the idea of *light* nor *window*; and this certainly they would not have done, had they thought the word meant a *common window*.—9thly. But what adds great confirmation to the above expoſition is, that the *common word* for *window* [viz. HaLUN, which is derived from a verb ſignifying to *bore* or *cut thro'*, and properly denotes a *Hole* or *Window* in a building] is not uſed in this place; and yet it is uſed in the account of the ark, *Gen.* vii. 6. where *Noah* is ſaid to *have opened the window of the ark and let out a raven*. Here a *window*, as generally underſtood, is certainly meant, and the common and proper word [HaLUN, not JER] is uſed; which

third ſtories ſhalt thou make it. And behold I, even I, do bring a flood of waters upon the earth to deſtroy all fleſh, wherein is the breath of life, from under heaven, and every thing that is in the earth ſhall die. But with thee will I eſtabliſh my covenant: and thou ſhalt come into the ark; thou, and thy ſons, and thy wife, and thy ſons wives with thee. And of every living thing of all fleſh, two of every ſort ſhalt thou bring into the ark, to keep them alive with thee: they ſhall be male and female. Of fowls after their kind, and of cattle after their kind, of every creeping thing of the earth after his kind: two of every ſort ſhall come unto thee, to keep them alive. And take thou unto thee of all food that is eaten, and thou ſhalt gather it to thee; and it ſhall be food for thee and for them. Thus did Noah; according to all that God commanded him, ſo did he.

WHAT *Foreſight* and *Wiſdom* were here requiſite! I have already proved that the *Deluge* was a *ſupernatural* act, and it is undeniably certain that no human knowledge, no natural experience, no deduction from cauſes or effects, could poſſibly have given mankind the leaſt notice of ſuch an event: of courſe a *revelation* (as *Moſes* informs us) muſt have been made to *Noah*, in order that he might foreſee, and be provided againſt, ſuch a tranſaction.

AND not only a revelation of the Fact, but the Means alſo declared, by which he might avoid the

which evidently ſhews, that ſome other interpretation than that of *Window* muſt be attributed to the word JER; and ſince the ſignification I have above contended for is ſo remarkably corroborated by ſuch a number of circumſtances, we may, I preſume, juſtly conclude it to be the true.

the conſequences of it, and have time to take due care for the preſervation of himſelf and family, and for repleniſhing the earth with a ſtock of its former inhabitants. As he was told that the *whole earth* was to be *deſtroyed* by a *flood of water*, ſo the moſt he could pre-conceive concerning the impending danger (allowing he could conjecture thus much, which, unleſs Shipping had been in uſe before the flood, he probably could not) was, that a veſſel of wood would be the moſt likely means of ſaving him, and all that was neceſſary to be ſecured: but of what *ſize* or *form* to make this veſſel, that it might ſuitably contain the things that were to be taken in, and anſwer in all other reſpects, no human wiſdom, I believe, could poſſibly adjuſt. Had man been left to himſelf to form a veſſel that ſhould conveniently hold a *certain number* of *all* the *various ſpecies* of *birds*, *beaſts*, and *creeping things* in the earth, and contain alſo *proper* and *ſufficient food* for them for the ſpace of a *whole year* (for ſo long the Deluge laſted) he probably would have made the veſſel unneceſſarily big, even ſo large as to endanger its ſafety: and this is pretty certain, from the objections which thoſe who have laid claim to the greateſt ſhare of *human Reaſon* (*viz.* our wiſe *free* or rather *no-thinkers*) have made to the *Moſaic* account, ſuppoſing the Ark therein deſcribed to have been of too narrow dimenſions. But *the wiſdom of man is fooliſhneſs with* God, and every objection to Scripture proves nothing but the folly of the objector, which in this caſe is abundantly manifeſt; for, after the ſtricteſt examination and

moſt

moſt accurate ſurvey, it has been proved by ſeveral learned perſons, that the ſize of the Ark, as given by *Moſes*, was exactly correſpondent to the things that were to be taken in.[d]

THAT this may more clearly appear, and the above objection be fully anſwered, I ſhall here annex Biſhop *Wilkins*'s Account of this affair in his *Eſſay towards a real character and a philoſophical Language*, p. 162, &c.

" HAVING now diſpatched (ſays the Biſhop) " the enumeration and deſcription of the ſeveral " ſpecies of Animals, I ſhall here take leave for " a ſhort Digreſſion, wherein I would recommend this, as a thing worthy to be obſerved, " namely, *That great difference* which there is " betwixt thoſe opinions and apprehenſions which " are occaſioned by *a more general* and *confuſed* " *view* of things, and thoſe which proceed from " a *more diſtinct conſideration* of them as they are " reduced into order.

" HE that looks upon the Stars, as they are " confuſedly ſcattered up and down in the Firmament, will think them to be (as they are " ſometimes ſtiled) *innumerable*, of ſo vaſt a multitude, as not to be determined to any ſet number; but when all theſe Stars are diſtinctly reduced into particular Conſtellations, and deſcribed by their ſeveral places, magnitudes, and " names, it appears, that of thoſe that are vi-

[d] See BUTEO *de Arca Nöe; cujus formæ & capacitatis fuerat*; Sir WALTER RALEIGH's *Hiſtory of the World*, Book I. Chap. 7. § 9. *That the Ark was of ſufficient capacity*. Biſhop WILKINS's *Eſſay towards a real character and a philoſophical language*. Part II. Chap. v. §. 6

" ſible

" ſible to the *naked* eye, there are but few more
" than a *thouſand* in the whole Firmament, and
" but a little more than half ſo many to be ſeen
" at once in any *Hemiſphere*. It is ſo likewiſe in
" other things: he that ſhould put the Queſtion,
" how many ſorts of beaſts, or birds, &c. there
" are in the world, would be anſwered, even by
" ſuch as are otherwiſe knowing and learned
" men, that there are ſo many hundreds of them,
" as could not be enumerated; whereas, upon a
" diſtinct inquiry into all ſuch as are yet known,
" and have been deſcribed by credible Authors,
" it will appear, that they are much fewer than
" is commonly imagined, not a hundred ſorts of
" Beaſts, nor two hundred of Birds.

" FROM this prejudice it is, that ſome here-
" ticks of old, and ſome atheiſtical ſcoffers in
" theſe later times, having taken the advantage
" of raiſing objections (ſuch as they think un-
" anſwerable) againſt the truth and authority of
" Scripture, particularly as to the deſcription
" which is given by *Moſes*, concerning *Noah's*
" *Ark*, *Gen.* vi. 15. where the dimenſions of it are
" ſet down to be three hundred Cubits in length,
" fifty in breadth, and thirty in heighth, which
" being compared with the things it was to con-
" tain, it ſeemed to them, upon a general view,
" (and they confidently affirmed accordingly) that
" it was utterly impoſſible for this Ark to hold ſo
" vaſt a multitude of Animals, with a whole
" year's proviſion of food for each of them.

" IT is plain in the deſcription which *Moſes*
" gives of the Ark, that it was divided into three

" ſtories,

" ſtories, each of them of ten cubits, or fifteen
" feet high, beſides one cubit allowed for the
" declivity of the roof in the upper ſtory. And
" it is agreed upon as moſt probable, that the
" lower ſtory was aſſigned to contain all the ſpe-
" cies of Beaſts, the middle ſtory for their food,
" and the upper ſtory, in one part of it, for the
" Birds and their food, and the other part for
" *Noah*, his family, and utenſils.

" Now it may clearly be made out, that each
" of theſe ſtories was of a ſufficient capacity for
" the containing all thoſe things to which they
" are aſſigned; even ſuppoſing the Cubit to be
" (at the loweſt computation) but a foot and
" half in length.

" For the more diſtinct clearing up of this, I
" ſhall firſt lay down ſeveral tables of the divers
" ſpecies of beaſts that were to be received into
" the Ark, with their different kinds of food,
" containing both the number appointed for each
" of them, namely, the clean by ſevens, and the
" unclean by pairs, together with a conjecture
" (for the greater facility of the calculation) what
" proportion each of them may bear either to a
" beef, or a ſheep, or a wolf; and then what
" kind of room may be allotted to the making
" of ſufficient ſtalls for their reception.

BEASTS *feeding on* Hay.

Number.	Name.	Proportion to Beeves.	Breadth of Stalls. Feet.	
2	Horſe	3		20
2	Aſſe	2		12
2	Camel	4		20
2	Elephant	8		36
7	Bull	7		40
7	Urus	7		40
7	Biſons	7		40
7	Bonaſus	7		40
7	Buffalo	7		40
7	Sheep	1		
7	Sterpciferos	1	30	
7	Broad-tail	1		
7	Goat	1		
7	Stone-buck	1		
7	Shamois	1	30	
7	Antelope	1		
7	Elke	7		30
7	Hart	4		30
7	Buck	3		20
7	Rein-deer	3		20
7	Roe	2		
2	Rhinoceros	8	36	
2	Camelopard	6		30
131		92		514

BEASTS *feeding on* Fruits, &c.

Number.	Name.	Proportion to Sheep.	Breadth of Stalls. Feet.	
2	Hog	4		
2	Baboon	2		
2	Ape	2		
2	Monkey			
2	Sloth			
2	Porcupine	7		20
2	Hedge-hog			
2	Squirrel			
2	Ginney-pig			
2	Ant-bear	2		
2	Armadillo	2		
2	Tortoiſe	2		

BEASTS *feeding on* Hay.

2	Hare	2	2
2	Rabbet		
2	Marmotto		
30		23	22

BEASTS *feeding on* Fleſh.

Number.	Name.	Proportion to Wolves.	Breadth of Stalls. Feet.	
2	Lion	4		10
2	Bear	4		10
2	Tyger	3		8
2	Pard	3		8
2	Ounce	2		6
2	Cat	2		6
2	Civet Cat			
2	Ferret			
2	Polecat			
2	Martin			
2	Stoat	3		9
2	Weaſle			
2	Caſtor			
2	Otter			
2	Dog	2		6
2	Wolf	2		6
2	Fox			
2	Badger	2		6
2	Jackall			
2	Caragua			
40		27		75

" IN this enumeration I do not mention the " mule, becauſe it is a mungrel production, and " not to be reckoned as a diſtinct ſpecies. And " tho' it be moſt probable, that the ſeveral va- " rieties of beeves, namely, that which is ſtiled " *Urus*, *Biſons*, *Bonaſus*, and *Buffalo*, and thoſe " other varieties reckoned under *ſheep* and *goats*, " be not diſtinct ſpecies from *bull*, *ſheep*, and *goat*; " there being much leſs difference betwixt theſe, " than there is betwixt ſeveral dogs: and it be-

" ing known by experience, what various changes
" are frequently occaſioned in the ſame ſpecies
" by ſeveral countries, diets, and other accidents;
" yet I have *ex abundanti*, to prevent all cavilling,
" allowed them to be diſtinct Species, and each
" of them to be clean beaſts, and conſequently
" ſuch as were to be received in by ſevens. As
" for the *morſe*, *ſeale*, *turtle*, or *ſea-tortoiſe*, *croco-*
" *dile*, *ſenembi*; theſe are uſually deſcribed to be
" ſuch kind of *Animals* as can abide in the
" water, and therefore I have not taken them
" into the Ark, tho' if that were neceſſary, there
" would be room enough for them, as will ſhort-
" ly appear. The *ſerpentine-kind*, *ſnake*, *viper*,
" *ſlow-worm*, *lizard*, *frog*, *toad*, might have ſuf-
" ficient ſpace for their reception, and for their
" nouriſhment, in the drein or ſink of the *Ark*,
" which was probably three or four feet under
" the floor, for the ſtanding of the beaſts. As
" for thoſe leſſer beaſts, *rat*, *mouſe*, *mole*, as like-
" wiſe for the ſeveral ſpecies of inſects, there can
" be no reaſon to queſtion, but that theſe may
" find ſufficient room in ſeveral parts of the *Ark*,
" without having any particular ſtalls appointed
" for them.

" It appears by the foregoing tables, that the
" beaſts of the *rapacious carnivorous kinds*, to be
" brought into the *Ark* by pairs, were but forty
" in all, or twenty pairs; which, upon a fair cal-
" culation, are ſuppoſed equivalent, as to the bulk
" of their bodies and their food, unto twenty-
" ſeven *wolves*; but for greater certainty, let them
" be ſuppoſed equal to thirty *wolves*: and let it

" be

" be farther ſuppoſed, that ſix *wolves* will every " day devour a whole *ſheep*, which all men will " readily grant to be more than ſufficient for " their neceſſary ſuſtenance: according to this " computation, five *ſheep* muſt be allotted to be " devoured for food each day of the year, which " amounts in the whole to 1825.

" UPON theſe ſuppoſitions there muſt be con- " venient room in the *lower ſtory* of the *Ark*, to " contain the fore-mentioned ſorts of beaſts, which " were to be preſerved for the propagation of " their kinds, beſides 1825 *ſheep*, which were to " be taken in as food for the *rapacious beaſts*.

" AND tho' there may ſeem no juſt ground of " exception, if theſe beaſts ſhould be ſtowed cloſe " together, as is now uſual in ſhips, when they " are to be tranſported for any long voyage; yet " I ſhall not take any ſuch advantage, but afford " them ſuch fair ſtalls, or cabins, as may be abun- " dantly ſufficient for them in any kind of poſture, " either ſtanding, or lying, or turning themſelves, " as likewiſe to receive all the dung that ſhould " proceed from them for a whole year.

" AND that the lower ſtory of the Ark was of " a ſufficient capacity for theſe purpoſes, will ap- " pear from the following conſiderations.

" [e] FIRST, let a partition of fifteen feet wide

[e] The Biſhop has here annexed a *large folio Drawing* of the *lower Story* of the Ark, and of the diſpoſition of the animals in it. But I have endeavoured to repreſent his meaning in ſuch a manner, that the reader may apprehend it, without the Draught; tho' if he be very curious I would adviſe him to refer to that, or rather to a more compleat Drawing, repreſented in the *Gentleman's Magazine* for *February* 1749; wherein *every Story* of the Ark, and the *diſpoſition* of *every thing* that was to be contained therein, are delineated in a moſt judicious manner, from a *Dutch* Author.

" be marked off, length-ways, at each end of the
" Ark. Now the breadth of the Ark being
" ſeventy-five feet, theſe partitions muſt contain
" in them five Areas of fifteen feet ſquare, and an
" area of five feet ſquare being ſufficient to con-
" tain four ſheep, therefore one of fifteen feet
" ſquare muſt be capable of thirty-ſix ſheep.
" Allowing one of theſe areas at each end for
" ſtairs, there will eight of them remain, (viz. four
" at each end) to be reckoned for the containing
" of ſheep; which eight will be capable of re-
" ceiving 288 *ſheep*.

" BESIDES theſe partitions at the end, let two
" other areas be marked off, paſſing along the
" middle of the floor length-ways of the Ark,
" each of them 25 feet wide, and about 200
" feet long. Now ſuppoſing theſe middle areas
" to be deſigned alſo for *ſheep*; an area of 25
" feet ſquare muſt be capable of holding 100,
" and there being ſixteen of theſe, they muſt be
" capable of containing 1600 ſheep, which being
" added to the former number of 288, will make
" 1888, ſomewhat more than 1825, the number
" aſſigned that were to be taken in for food.

" ON each ſide of the middle areas for the ſheep,
" let us ſuppoſe a paſſage of ſeven feet wide, for
" the more convenient acceſs to the ſheep, and
" the ſtalls that are to ſerve for the other beaſts.

" ON this diviſion of the *lower floor* of the Ark,
" there will remain four other areas (two on each
" ſide of the middle areas for the ſheep) each
" of them 18 feet wide, and 200 feet long,
" which will be more than ſufficient to con-
" tain the ſeveral beaſts which were to be pre-

" ſerved

" ſerved for the propagating of their kind; for " which, in the foregoing tables, there is allotted " to the length of the ſtalls only 611 feet, be- " ſides the largeneſs of the ſtalls allowed to each " of them. So that upon this fair computation, " there will be very near *two hundred feet over-* " *plus* in this lower ſtory, for the reception of any " other beaſt not yet enumerated, or diſcovered.

" The next thing to be cleared up, is the *ca-* " *pacity* of the *ſecond Story* for containing *a year's* " *proviſion of food.* In order to which 'tis to be " obſerved, that the ſeveral beaſts feeding on " hay were before, upon a fair calculation, ſup- " poſed equal to ninety-two *beeves:* but to pre- " vent all kind of cavils which may be made at " the proportioning of them, let them be as a " 100, beſides the 1825 *ſheep* taken in for food. " But now, becauſe theſe are to be devoured by " five *per diem*, therefore the year's proviſion to " be made for them is to be reckoned but as " for half that number, *viz.* 912. Theſe being " divided by ſeven, to bring them into propor- " tion with the *beeves*, will amount to 180, which " added to the former 100 make 280, ſuppoſe " 300. So then, according to this ſuppoſition, " there muſt be ſufficient proviſion of hay in the " ſecond ſtory to ſuſtain 300 beeves for a whole " year.

" Now 'tis obſerved (ſaith *Buteo*) by *Columella*, " who was very well verſed in the experiments of " huſbandry, that thirty or forty pound of hay is " ordinarily ſufficient for an *ox* for one day, reck- " oning twelve ounces in the pound. But we

" will ſuppoſe forty of our pounds. And 'tis aſ-
" ſerted by *Buteo*, upon his own trial and expe-
" rience, that a ſolid cubit of dry'd hay, com-
" preſſed, as it uſes to be when it hath lain any
" conſiderable time in mows or ricks, doth weigh
" about forty pound; ſo that for 300 *beeves* for
" a whole year, there muſt be 109,500 ſuch cu-
" bits of hay, (i. e.) 365 multiplied by 300.
" Now the ſecond ſtory, being ten cubits high,
" 300 long, and fifty broad, muſt contain 150,000
" ſolid cubits, which is more by 40,500 than
" what is neceſſary for ſo much compreſſed hay;
" and will allow ſpace enough both for any kind
" of beams and pillars neceſſary for the fabric, or
" likewiſe for other repoſitories, for ſuch fruits,
" roots, grain, or ſeeds, as may be proper for the
" nouriſhment of any of the other *animals*; and
" likewiſe for ſuch convenient paſſages and aper-
" tures in the floor, as might be neceſſary for the
" putting down of the hay to the ſtalls in the
" lower ſtory. From which it is manifeſt, that
" the ſecond ſtory was ſufficiently capacious of
" all thoſe things deſigned for it.

" AND then as for the *third ſtory*; there can be
" no colour of doubt, but that one half of it will
" be abundantly ſufficient for all the ſpecies of
" birds, together with food ſufficient for their
" ſuſtenance, becauſe they are generally but of
" ſmall bulk, and may eaſily be kept in ſeveral
" partitions, or cages, over one another. Nor is
" there any reaſon to queſtion, but that the other
" half would afford ſpace enough both for *Noah*'s
" family and utenſils.

" UPON

" UPON the whole matter, it doth, of the two, " appear more difficult to aſſign a ſufficient num- " ber and bulk of neceſſary things, to anſwer the " capacity of the *ark*, rather than to find ſufficient " room for thoſe ſeveral ſpecies of *animals* already " known. But becauſe it may be reaſonably pre- " ſumed, that there are ſeveral other ſpecies of " beaſts and birds, eſpecially in the undiſcovered " parts of the world, beſides thoſe here enume- " rated, therefore it is but reaſonable to ſuppoſe " the *ark* to be of a bigger capacity, than what " may be ſufficient for the things already known; " and upon this account it may be aſſerted, that " if ſuch perſons, who are moſt expert in philo- " ſophy and mathematicks, were now to aſſign " the proportions of a veſſel that might be ſuit- " able to the ends here propoſed, they could not " (all things conſidered) find out any more ac- " commodate to theſe purpoſes, than thoſe here " mentioned."

To the above obſervations, I may add, what is recorded by *Parker* in his *Bibliotheca Biblica*, vol. I. *Occaſ. Annot.* 13. that *Peter Janſen*, a *Dutch* merchant, about the beginning of the laſt century, cauſed a ſhip to be built for him, anſwering, in its reſpective proportions, to thoſe of *Noah*'s ark, the length of it being 120 feet, the breadth of it 20, and the depth of it 12. At firſt, this was looked upon no better than a fanatical Viſion of this *Janſen* (who was by profeſſion a *Menoniſt*) and whilſt it was building, he and his ſhip were made the ſport of the ſeamen, as much as *Noah* and his ark could be. But afterwards, it

was found, that ſhips, built in this faſhion, were, in the time of peace, beyond all others moſt commodious for commerce; becauſe they would hold a third part more, without requiring any more hands, and were found far better *runners* than any made before.

And tho' *Moſes* could not but foreſee, that ſuch objections as theſe would be raiſed againſt his account, yet he left it to ſtand the teſt, barely relating the fact, not anxiouſly explaining the reaſon of every thing; well knowing that he was directed in what he ſaid by *Infinite Wiſdom*, who would *order all things in meaſure, and number, and weight*; and quite ſatisfied, that if man would but act the proper part, and uſe his reaſon aright, that is, not judge till he had well weighed and conſidered the ſubject, the juſtneſs and propriety of what he related would eminently appear. Hence, by the way, we may ſee the great neceſſity of much natural knowledge in order to apprehend the philoſophical parts of the Bible, and that *Moſes* did not ſuit his deſcriptions of things to the capacities of the vulgar, but wrote for the moſt improved Underſtandings.

Again; as it was neceſſary that *two* at leaſt of *each ſpecies* of *animals of the land and air*, and theſe a *male* and *female* (for future propagation) ſhould be taken into the Ark, ſo it was impoſſible that *Noah* and his family of themſelves could have collected them together; many of the *creeping kind* are ſo ſmall as to eſcape the human ſight, unaſſiſted by the beſt glaſſes, and probably many there are that cannot be diſcerned even by the help

help of them, at leaſt ſo far as to diſcover which are *male* and which *female*; others are of ſo ſwift a flight, or of ſo wild and rapacious a nature, that they cannot be caught and tamed by man: God therefore muſt have directed the *ſeveral kinds* in *ſuitable numbers* to the Ark (probably in the manner he influenced them to come to *Adam*, when they were firſt named, *Gen.* ii. 19.) Agreeably to this *Moſes* informs us, that the ſame divine Perſon who forewarned *Noah* of the flood, aſſured him, that *two* [or rather, as the word may be render'd, *couples*; for more than two of ſome ſpecies were taken in] *of every ſort ſhould come unto him to be kept alive*, *Gen.* vi. 20.

All theſe articles were neceſſary to be known, all theſe preparations neceſſary to be made by thoſe who could poſſibly be ſaved, and anſwer the end of their ſalvation (by being able to repleniſh the Earth with a ſtock of its former inhabitants) in ſuch a Flood as was That in the time of *Noah*. But theſe articles could not be known, nor could theſe preparations be made, without *divine aſſiſtance*; ſuch aſſiſtance therefore was *undeniably* given to *Noah*; and it is equally undeniable, that *all thoſe*, who had it not, periſhed. Hence our Saviour repreſents the Flood as coming upon the *ungodly* quite unexpectedly, *Matt.* xxiv. 38. *In the days that were before the flood, they were eating and drinking, marrying and giving in marriage, until the day that Noah entered into the ark, and* KNEW NOT *until the flood came and took them* ALL *away.* Surely then none either did or could eſcape; for if even a few had reached the higheſt mountains,

mountains, yet as they had had no time to prepare themſelves with food and the common neceſſaries of life, they muſt ſoon have periſhed thro' hunger.

AGAIN; had not the Deluge been univerſal, but *partial only*, and extended even over one half of the globe, there certainly had been no need of the Ark. *Noah* and his family might have retired from the deſtruction, in the ſame manner as *Lot* and his family did from that of *Sodom*, and the countries adjacent, into ſome other part of the earth; and this might have been done in much leſs time, and with far leſs care and trouble, than to have built ſo large a veſſel as the Ark was, and prepared all the neceſſary things for the ſafety of the animals that were to be included. At leaſt had the Deluge been partial, there had been no occaſion of taking in animals of *every kind*, male and female, of *every ſort*, *to keep ſeed alive upon the face of all the earth*; (*Gen.* vii. 3.) for had any iſlands or countries, with the creatures peculiar thereunto, been exempted from the common calamity (as our Author ſuppoſes) it had been needleſs to have preſerved *ſuch* by means of the Ark; or indeed to have taken in *any* of the *Brute-creation* at all, ſince they might have been conducted to thoſe parts of the earth which the Deluge reached not, by the ſame means that they were brought to the ark to be ſaved thereby; many of the *beaſts*, ſuch as are of the ſwift and wild kind, might eaſily have eſcaped thither; and the *birds*, without difficulty, might have fled, from the approaching danger, into the moſt diſtant regions of

of the earth. But as all this precaution was taken, all theſe meaſures executed, it is certain that GOD *intended* that the *Deluge* ſhould be *univerſal*; and we ſhall ſee hereafter from the *effects* of it, that it *really* was *ſo*.

FOR, as ſoon as *Noah* and the animals were entered into the ark, we are told, that

All the Fountains of the Great Deep were broken up.

THE Maker of this earth (who certainly knows its inward as well as outward ſtructure) has informed us, that there is a *vaſt collection of waters within* it, characteriſed (to diſtinguiſh it from all *leſſer* Deeps, Seas, &c.) under the name of the GREAT DEEP; it is called, *Gen.* xlix. 25. *The Deep that lieth under*, i. e. the earth; and *Deut.* xxxiii. 13. *The Deep that coucheth beneath*. From this reſervoir all fountains and rivers receive their ſupplies, as the wiſeſt of natural Philoſophers has told us, *Eccleſ.* i. 7. *All the rivers run into the Sea* [the general collection of waters, part high up, and part beneath, the earth] *yet the Sea is not full* [doth not reach the height of, or run over, its ſhores] *Unto the place from whence the rivers came, thither they return again.*[f] The ſhell of the earth is repreſented as lying directly over this abyſs, or covering it, as an *Arch* ſtretched over an *orb* of *water*; ſo the *Pſalmiſt*, xxiv. 1. *The earth is the* LORD's—*for he hath* FOUNDED *it* UPON THE SEAS, *and* ESTABLISHED *it* UPON THE FLOODS;

[f] This collection of waters I have deſignated by G. H. in *Plate the ſecond*, which the reader will conſult, and alſo what is ſaid in Note °.

FLOODS; and again, CXXXVI. *O give thanks to the* LORD *of Lords, who alone doth great wonders;— to Him* (for this is a wonderful and very beneficial act) *that* STRETCHED OUT *the earth above the waters.* So of the *firſt ſediment, ſtrata,* and *laying the foundations* of the earth, *Prov.* viii. 27. *When he prepared the heavens, I was there; when he ſet a* Circle *upon the face of the Depth; when he appointed the* foundations *of the earth.* And *Job* XXXVIII. 4. *Where waſt thou when I* laid *the* foundations *of the earth? Whereupon are the ſockets thereof faſtened? Or who had laid* the Corner-ſtone [the *key-ſtone* of the *arch*] *thereof?* And ch. XXVI. 10. *He ſet a* Circle *upon the face of the waters.* So that the ſhell of the earth is of a *circular form,* comprehending (as the ſhell of an Egg contains the fluid within) an *immenſe quantity of Water,* characteriſed in Scripture under the name of the *great Deep* or *Abyſs.*

As this notion of the earth's containing within itſelf *an Abyſs of Water* is maintained by ſome of the moſt antient Heathen writers, and it doth not ſeem probable that they procured the knowledge of it by any diſcovery of their own, and therefore that they obtained it at firſt *from Revelation* by Tradition, I ſhall here annex their evidence as being, in this reſpect, *properly divine.*

PLATO in his *Phædon* (near the end) writeth thus, "Και ολην μεν δη την γην, &c. And ſuch "is the form and conſtitution of the whole earth, "and the things that are about it. There are "ſeveral *circular Hollows* in its inſide, ſome "deeper, ſome wider, ſome narrower, &c. But

"all

" all the Cavities every where perforate one an-
" other, and are open at both ends, by means
" of which a great quantity of water flows from
" one into another, as into ciſterns. There are
" alſo under-ground incredible large rivers, and
" perpetual ſprings of waters both hot and cold.
" But *One* of theſe concavities in the inſide of the
" earth is *greater* than the reſt, piercing from
" ſide to ſide through the whole Earth; which
" *Homer* mentions in this verſe, Iliad. Θ. v. 14.

Τηλε μαλ', ηχι βαθιστον υπο χθονος εστι βερεθρον.
Far hence, in th'earth there gapes a gulph immenſe.

" Which both he elſewhere, and many other
" Poets, call *Tartarus*, into which all rivers have
" their confluence, and flow out of it again by
" turns. Each river comes out tinctured with
" the nature of the earth thro' which it flows.
" And the reaſon why the rivers flow thither, and
" come back again, is, becauſe *the Abyſs* has neither
" bottom nor baſe; and therefore tho' they are
" lifted up, they naturally flow down again: as
" alſo does the *Air* or *Spirit* that attends them.
" And as in the reſpiration of animals, there is an
" inceſſant ingreſs and egreſs of the air, ſo the air,
" that is mingled with the waters, accompanies
" them in their ingreſs and egreſs, and raiſes
" raging winds. When theſe waters fall into
" this *lower Abyſs*, they diffuſe themſelves into all
" channels of the ſprings and rivers, and fill them
" up; juſt as if one were drawing water up with
" two pails, one of which fills as the other emp-

" ties:

" ties: for theſe rivers flowing from thence fill
" up all our channels; from whence diffuſing
" themſelves about, they conſtitute *our Seas,*
" *Rivers, Lakes,* and *Fountains.*"

So *Heſiod, Theog.* l. 119.

Ταρταρα τ' ηεροεντα μυχω χθονος ευρυοδειης.

And dark Tartarus *in the* Earth's receſs.

AND again; *Homer, Iliad.* Φ. 195.

Ουδε βαθυρρειταο μεγα σθενος Ωκεανοιο,
Ος περ παντες ποταμοι τε πασα θαλασσα,
Και πασαι κρηναι τε φρεατα μακρα ναουσιν.

Nor great Oceanus, *from whoſe fountains flow*
All Seas, all Rivers, *and* all Springs below.

IT is remarkable, that the moſt antient Heathen Authors often ſpeak of *Oceanus* [under which term they comprehended the immenſe body of water within the Earth, as well as that without] as *the Parent* of their Gods; as indeed He was; for the ſubſidence, or retirement of the great Abyſs (at the end of the Deluge) to its original bed, the Boſom of the Earth, reſtored to them *the Lights of Heaven* (which they worſhiped as *Gods)* and the uſe of the *Earth*, ſee *Gen.* viii. 22.

So *Homer* (Iliad. Ξ. 200.) makes *Juno* ſpeak thus:

Ειμι γαρ οψομενη πολυφορβα πειρατα γαιης,
Ωκεανον τε, θεων γενεσιν, και μητερα Τηθυν, &c.

Then

Then ſhe—I haſte to thoſe remote *abodes,*
Where the Great Parents *of the deathleſs Gods,*
The rev'rend Ocean *and grey* Tethys *reign,*
On the laſt limits of the land and main:
I viſit theſe, to whoſe indulgent cares
I owe the nurſing of my tender years.

BUT more particularly *Orpheus* in his hymns, writes thus, p. 178.

Ωκεανον καλεω, πατερ' αφθιτου αιεν εοντα,
Αθανατων τε θεων γενεσιν θνητων τ' ανθρωπων,
Ος περικυμαινει γαιης περιτερμονα κυκλον.
Εξ ου περ παντες ποταμοι κὴ πασα θαλασσα,
Και χθονιοι γαιης πηγορρυτοι ικμαδες αγναι.

O Father Ocean! *'tis to thee I call,*
Of Gods *and* Men *the* GREAT ORIGINAL;
Thee I invoke! who with thy cloſe embrace,
Surround'ſt the earth, the ſeat of human race;
From thee all Seas *and* Rivers *take their riſe,*
And Waters ſubterrene *receive ſupplies.*

AND again, p. 114.

Κλυθι Ποσειδαον γαιηοχε ———
Ος ναιεις πουτοιο Βαθυς-ερυοιο θεμεθλα,
Πουτομεδων, αλιδατε, Ταρυκλυτε, εννοσιγαιε, &c.

I CANNOT better illuſtrate the meaning of ſome of theſe epithets given to *Oceanus* or *Neptune*, or ſhew how applicable they are to the point in hand, than in the words of Dr. *Woodward* (vid. *Nat. Hiſt. of the Earth*, p. 138.) " Theſe Phœnomena

" are

" are not new, or peculiar to the Earthquakes,
" which have happened in our times, but have
" been obſerved in *all ages*, and particularly theſe
" *exorbitant commotions* of the *Water* of the
" Globe. This we may learn abundantly from
" the hiſtories of former times; and it was for
" this reaſon that many of the antients conclud-
" ed, rightly enough, that *they* were cauſed by
" the impulſes and fluctuation of water in the
" bowels of the Earth. And therefore they very
" frequently called *Neptune* Σεισιχθων, as alſo
" Ενοσιχθων, Ενοσιγαιος, and Τιναχτορογαιης; by all
" which Epithets they denoted his power of
" *Shaking the Earth*. They ſuppoſed that he
" preſided over all water whatever, as well that
" within the Earth, as the Sea, and the reſt upon
" it; and that the Earth was ſupported by water,
" its foundations being laid thereon: upon which
" account it was that they beſtowed upon him the
" cognomen Γαιηοχος, or *Supporter of the Earth*,
" and that of Θεμελιοχος, or *the Suſtainer of its foun-*
" *dations*. They likewiſe believed that he, having
" a full ſway and command over the Water,
" had power to ſtill and compoſe it, as well as
" to move and diſturb it, and the Earth by means
" of it: and therefore they alſo gave him the
" name of Ασφαλιος, or the *Eſtabliſher*; under
" which name ſeveral temples were conſecrated
" to him, and Sacrifices offered, whenever an
" Earthquake happened, to pacify, and appeaſe
" him; requeſting that he would allay the com-
" motions of the water, ſecure the foundations
" of the earth, and put an end to the Earthquake."

BESIDES

BESIDES all this, *Lucretius* (*Lib.* v. 261.) argues thus:

Quod ſupereſt, humore novo mare, flumina, fontes
Semper abundare, *et latices manare* perennes,
Nil opus eſt verbis, magnus decurſus *aquarum*
Undique *declarat*: *ſed primum quicquid aquai*
Tollitur, in ſummaque fit, ut nihil humor abundet,
Partim quod validi verrentes æquora venti
Diminuunt, radiiſque retexens ætherius Sol:
Partim quod ſubter per terras diditur omnes.
Percolatur enim virus, retroque remanat
Materies humoris, et ad caput amnibus omnis
Convenit; *inde* ſuper terras *fluit agmine dulci,*
Qua via ſecta ſemel liquido pede detulit undas.

Beſides; that *Seas*, that *rivers* waſte and die,
And ſtill *increaſe* by conſtant *new* ſupply,
What need of proofs? this ſtreams themſelves do ſhow,
As all run murm'ring to the *Sea below*.
But leſt the maſs of waters prove too great,
The Sun drinks ſome, to quench his natural heat;
And ſome the winds bruſh off, with wanton play
They dip their wings, and bear ſome parts away:
Some paſſes *thro' the earth*, *diffus'd all o'er*,
And leaves its ſalt behind at every pore;
For all *return* thro' *ſecret channels* ſpread,
And join, where *firſt they* iſſu'd from their bed;
Hence on the earth in fair mæanders play,
And thro' the vallies cut their liquid way.

CREECH.

OF *Chriſtian* writers that have mentioned the *Abyſs*, I ſhall only inſert the opinion of *John de la Hay*, as his deſcription is very juſt, and contains a comment on the words under conſideration, viz. *And the fountains of the great deep were broken up. Facilior erit horum verborum intelligentia*, &c. i. e. "We ſhall more readily underſtand theſe Words, if we inquire into the meaning of the word *Abyſs* or *Deep*, which is nothing elſe than an hidden place in the Bowels of the Earth, where the Waters lie hid, and from whence Fountains and Lakes have their riſe; and it is called the *Great Deep*, by way of diſtinction from ſome leſſer Hollows in the Earth; for this is, as it were, the Mother of them all, to whom they are all joined by Veins and Paſſages: the Fountains therefore of that *Great Abyſs* were broken up, is, as if he had ſaid, ſuch a Quantity of Water burſt from that Great Deep, that its common Outlets were broke or burſt open, like a Land-flood, when it meets with Reſiſtance; the too great quantity of water breaks down the Channels and Banks, which, as it were, impriſoned it: but not only the Fountains of that Deep were broken open, but the Sea came out of its bounds, pouring over the Earth, and the Rivers burſt forth with the greateſt Violence."

SUCH then, according to Scripture and Heathen Teſtimony, is the Conſtitution of the Earth, that it contains within itſelf an immenſe reſervoir of water, denominated by the name of the GREAT DEEP; the *fountains of which were broken up*,

up, in order to effect the *Deluge* in the time of *Noah*.

But before I can shew *particularly* how this great Event was brought to pass—what alterations were made in the Terraqueous Globe at that time—the Agents that were employed—and the manner of their acting—it will be proper to say something of the *original formation* of the *Earth*; which is thus described by *Moses*.

Gen. i. 1. *In the beginning* [BeRASIT, in the first place[g]] *God created* [gave existence to] AT, [the Atoms, the Substance of] *the Heavens* [VAT] *and* [the Substance of] *the Earth*.

And the Earth was without form [a formless mass; the parts for Solids and Fluids being confusedly mixt together] *and void*, [empty, hollow within.]

[g] Which easy and natural interpretation of the word BeRASIT frees the Scripture from an impertinent question that some have put here, viz. *In the beginning of what?* As if *Moses* had represented God as having *created the World in the beginning of the World*, or in the *beginning of Time* (which is the same thing, for *Time began* with the *World*) which would have been an idle tautology. But to tell us, that the *first act* that was done in the *History* that he was going to give of *the Generations of the Heaven, and of the Earth, and of Mankind*, (*Gen.* ii. 4—8.) was the *production of the world de novo*, or that *the Aleim*, his God, *created* it, is not only sense, but highly proper, as it struck at the *very root* of the *Idolatry* then prevailing in the world, which was the *worshipping of the creature instead of the Creator*, or the works of God, instead of God himself. So that as *J. Neirenberg* says, "*In uno duntaxat capite, primo Geneseos, puto plus docuisse Moysem quam cæteros omnes philosophos et naturæ interpretes*; i. e. *I think that Moses has taught us more philosophy in one single chapter*—viz. *the first of Genesis, than all the philosophers and explainers of Nature put together*. So I may say, that *Moses* has taught us more *theology* in one single verse of that chapter, than all the heathen world could have discovered by any means of their own.

And Darkneſs [dark, torpid Air] *was upon the face of the* Deep.

And the Spirit of God [RUE ALEIM] *moved upon the face of the Waters.* This is the *firſt Agent* or *Mover* mentioned to have been employed towards reducing the *formleſs* maſs of the Earth into *ſhape.* What *this Spirit* is, may be judged of from ſimilar paſſages in Scripture.

THE word rendered *Spirit* [RUE] is the ſame as is uſually tranſlated *Wind*, and denotes *Air in motion*, as *Iſa.* xl. 7. *The graſs withereth, the flower fadeth; becauſe* the Spirit of the LORD BLOWETH *upon it.* Here certainly the natural motion of the wind is meant; as alſo it is in the following paſſages, *Pſalm* cxlvii. 16. *He giveth ſnow like wool; ſcattereth the hoar-froſt like aſhes. He caſteth forth his ice like morſels; who can ſtand before his cold? He ſendeth out* his Word [ſymbolically placed for *the Light of the Sun*; as his *real Son* is the *Light of the World*, and *the Word of life*] *and melteth them: he cauſeth* his Wind [RUE, *his Spirit*] *to blow, and the waters flow. Pſalm* xxxv. 5. *Let them be as Chaff before the Wind* [RUE], *and let the Angel* [the Agent, the Wind] *of the Lord chaſe them.* Hoſea xiii. 15. *Though he be fruitful among his Brethren, an Eaſt Wind ſhall come, the* WIND OF THE LORD [RUE JEHOVAH] *ſhall come up from the Wilderneſs, and his ſpring ſhall become dry, and his fountain ſhall be dried up.* So alſo, *Job* xxxvii. 21. *And now men ſee not the bright light which is in the clouds* [more properly it means, *in the ſkies*]: *but the Wind* [the Spirit] *paſſeth away and cleanſeth them;*

them; i. e. *by the motion of the air* the ſky is cleared, and the light rendered viſible. So again, ch. xxxvi. 16. *By* his Spirit *he hath garniſhed the Heavens.*

BUT what more evidently confirms the above interpretation is, that at the time of the Deluge, when the Earth was *totally diſſolved*, and all things in the *ſame confuſed* ſtate they were at the beginning of its formation, the ſame Agent is mentioned to have been employed towards the reforming of it, *viz. Gen.* viii. 1. *And* GOD *made* a Wind [RUE, the Spirit] *to paſs over the earth, and the waters aſſwaged.* Here certainly a *motion in the air* is meant, and as certainly it is to be underſtood in the former caſe, when we are told, *that the Spirit of* GOD moved *upon the face of the waters*; i. e. GOD by his immediate power cauſed a motion or raiſed an agitation in the (before) dark, ſtagnant Air around the earth, (and it is called *His Spirit*, becauſe he alone did, or indeed could, produce ſuch a motion) which MeRcHPeT, MOVED. This word in the original, as his Lordſhip of *Clogher* obſerves (who alſo allows that the *Spirit* here ſpoken of is the *Air*[h]) ſignifies properly "a

[h] See *his Vindication of the hiſtories of the Old and New Teſtament*, Part II. p. 47. Many antient writers have thus interpreted it, as *Philo Judæus, Martin de Borbai, Joannes Mariana*, and two or three of the Fathers, were of this opinion, as his Lordſhip obſerves. And even *Hobbes* (whoſe opinion may pleaſe ſome perſons better than any one's elſe) argues thus, (*Leviat.* p. 208.) "*Gen.* "i. 2. *The Spirit of* GOD *moved upon the face of the waters.* Here, "if by *the Spirit of* GOD be meant GOD himſelf, then is *motion* "attributed to GOD, and conſequently *place*, which are intel-"ligible only of bodies, and not of ſubſtances incorporeal; and "ſo the place is above our underſtanding, that can conceive no-

"thing

" *ſhivering* or *tremulous kind* of motion, ſuch as " a man maketh, when he ſhaketh for fear; in " which ſenſe the word is uſed *Jer.* xxiii. 9. or " as a hen [*Deut.* xxxii. 11. *an eagle*] uſeth when " ſhe expandeth her body and wings [*fluttereth*] " over her brood of chickens [*her young ones*]. " And therefore this word is elegantly expreſ- " ſive of the *vibrating motion of the Air.*" This action of the air, we are told, was *upon the face of the waters*, *i. e.* upon the *ſurface* of the *fluid turbid maſs* of the earth, and therefore would have ſuitable effects upon it, *i. e.* by ſurrounding and compreſſing the outſide, would determine the earth to be of a *ſpherical* or *orbicular* ſhape, as the action of the Air upon any fluid body, ſuſpended in it, at preſent determines it to be. But the groſs action of the Spirit alone could not enter much beyond the ſurface, or cauſe any great alteration in the *Inſide*; ſome other therefore, more ſubtile, penetrating Agent, than this, was requiſite to form *the ſhell of the earth*, or drive together the *ſolid atoms* thereof. Accordingly the next thing we read of was the Production of Light.

And God *ſaid* [decreed, commanded] *Let there be Light; and there was Light.*

HERE

" thing moved that changes not place, or that has not dimenſion; " and whatſoever has dimenſion, is body. But the meaning of " thoſe words is beſt underſtood by the like places, *Gen.* viii. 1. " Where when the earth was covered with waters, as in the be- " ginning, God intending to abate them, and again to diſcover " the dry land, uſeth the like words, *I will bring my Spirit upon* " *the earth, and the waters ſhall be diminiſhed.* In which place by " *Spirit* is underſtood a wind, (that is, an air or *ſpirit moved*) " which might be called (as in the former place) the *Spirit of* " God, becauſe it was God's work."

HERE an Agent is introduced, the moſt ſubtile as well as moſt powerful of any in nature. We all know, that *Light* paſſes freely through the hardeſt and cloſeſt of terreſtrial ſubſtances, and when its atoms are collected in a focus, will ſeparate and diſſolve the parts of the moſt compact body. Here then are two very powerful Agents; one that diſplays itſelf principally by *preſſure*, the other by *penetration*. And what might nŏt ſuch Agents as theſe do, in the hand of the mighty Creator? No Command in Nature could be inſuperable to ſuch ſervants, under the direction of ſuch a Maſter. We need not therefore wonder, if we ſhould hear of great and mighty events brought about by theſe Agents in ever ſo ſhort a ſpace of time, nay, if the earth, from a *formleſs*, *fluid*, *confuſed maſs*, ſhould be made, within the ſpace of a day or two, into a *ſolid habitable Globe*. To effect which, theſe Agents are put in commiſſion by the following Command.

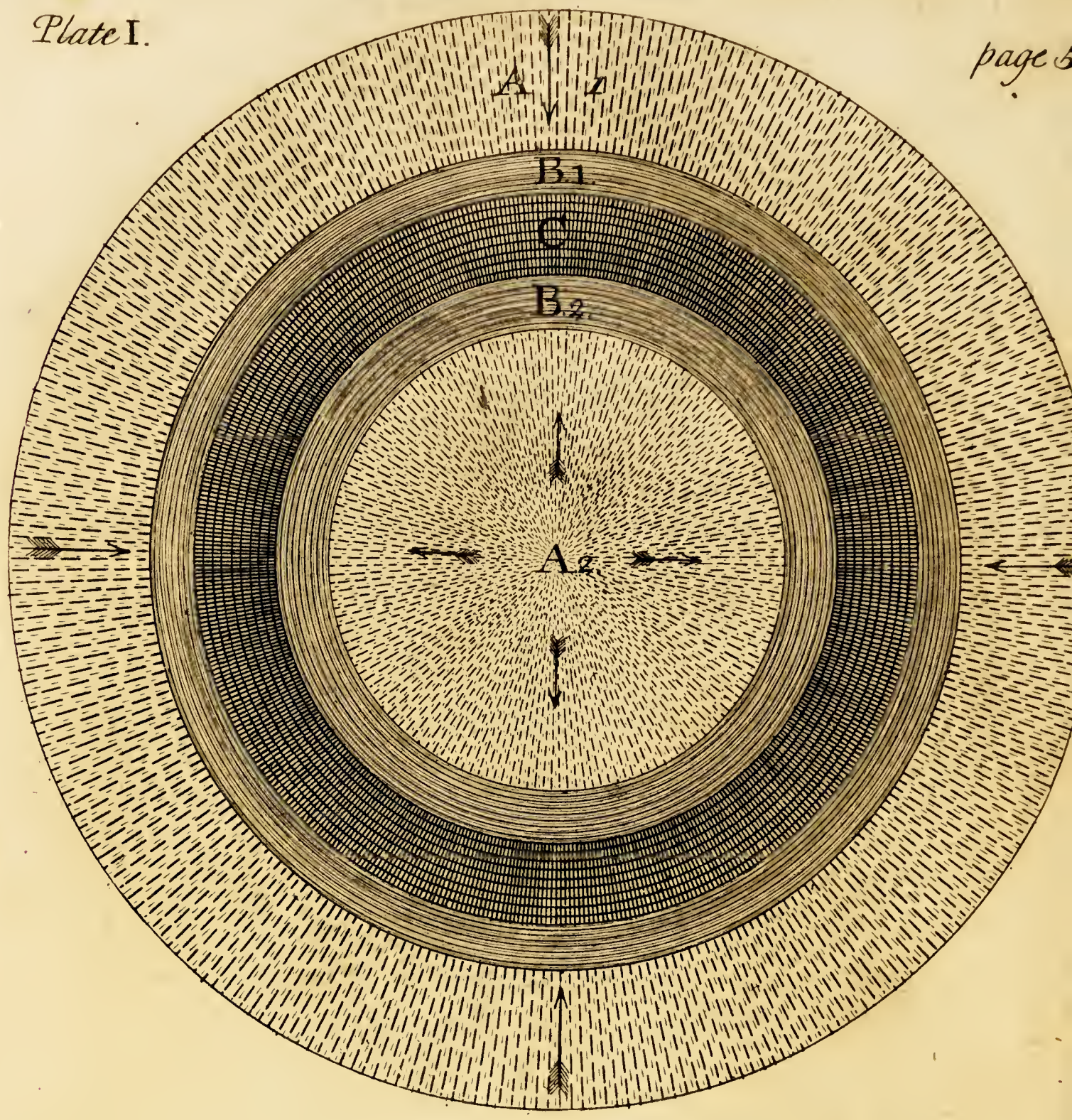
And God ſaid, Let there be a Firmament [marg. *Expanſion*] *in the* MIDST *of the* WATERS [the *fluid*, *chaotic* maſs of the Earth, called *Waters* before, ver. 2.] *and let it* [there] *divide the waters from the waters.* The reader then will remember that this whole tranſaction was to be *upon* or *in* the Earth, not in the *midſt of the heavens*, or in the Air at a vaſt diſtance from the Earth, as many Commentators have imagined, but the whole tranſaction was to be in *the midſt of the waters* of the Earth.

AND the words plainly imply, as others in this chapter do, a Command to the natural *Agents* to

operate. Light had been formed, had reached and acted upon this Globe: and wherever Light and Spirit [or Air in motion] are, there would of course be a *struggle* between them, and this struggle would produce an *Expansion*, this expansion a division, and so on. The word for *Firmament*, RaQIO, explains what the Firmament is; the word signifies, as we see in the margin of our bibles, *Expansion*, and the meaning is, Let the *Light* and *Spirit* expand and diffuse themselves, and let them press into the mixture, called *Waters*; and let them act *in*, *among*, or *between* the *parts* of it, and drive the solid parts together, and thereby make a *separation*, and with the parts separated a *division* or wall between the waters; so that one moiety of the waters shall lie on one side of this wall, and the other on the other side.

To explain how this was done: The Earth, we are told, was created *void*, (Genesis i. 2.) i. e. *hollow*, *empty within* (as the word means, *Isaiah* xlv. 18.) or with a *large central Hollow*, (called, *Job* xxxviii. 8. the *womb* of the earth) filled *only* with *air*, as every *hollow* place in the earth at present is *filled*. As soon therefore as the light had reached this *central* or *inward* air, there would instantly commence a conflict between them, or a struggling this way and that as from a center; which is obvious to every ordinary capacity in the case of a bladder that is flaccid or half-filled with air, when held before the fire. The light (which not even the closest-compacted substance can deny a passage to) issues forth from the fire, and penetrates the pores of the bladder, drives itself in amongst the gross air, which must force That to push

Plate I.



A. 1. *The outward Expanse.* } { *At first, dark Air on y^e outsi*
A. 2. *The inward Expanse.* } { *and in the inside of y^e Earth.*

B. 1. *An orb of water, separated by the action of the outward Ex*
panse from the Earthy mass: called the waters under the firmamen

B. 2. *An orb of water, separated by the action of the inward Ex-*
panse from the Earthy mass: called the waters above the firmamen

C. *The solid shell of the Earth formed, between two orbs of wate*
into various concentric strata of stone, coal, &c. by the action of
the two Expanses.

The Three several orbs B. 1. B. 2. *and* C. *were at first confusedly mixed*
together, and then called the Earth without form.

NB. This Plate represents also the Earth during the height of the Deluge

puſh itſelf every way outward, and diſtend the ſides of the bladder that encloſes it.

THUS would the *inward* Expanſe [denoted by A. 2. in plate I.] or expanding air act *upwards* every way from the center to the circumference of the chaotic mixture; while the *outward* Expanſe [A 1.] or the light and ſpirit on the *outſide* of this globe would act *downwards*, on, and through every part of it. And by theſe two equal and counter-acting agents, the *earthy*, or *ſolid parts* of the chaotic maſs, would be driven together into a *ſpherical ſhell* [C.] at a conſiderable diſtance from the center of the earth, and there be ſuſtained; and as the earthy or ſolid parts would be driven together into a cloſe hard ſhell or cruſt, ſo by the ſame action would the *fluids* be permitted to ſlip between on *each* ſide of this cruſt. Thus would the *ſhell* of ſtone, or *the Earth*, be formed between *two orbs* of *water*; one orb [B. 1.] would cover the *outward* ſurface; the other [B. 2.] would cover, or by the force of the expanding air from the center be preſſed cloſe to, the *inward* ſurface of the earth. Such being the ſituation of things, it will now be apparent to every one, how the earth was *founded upon* and formed *between* the *waters*.—And as the ſhell, or cruſt of the earth, was driven together by the *expanſive* power of the air, and formed between two orbs of water, ſo the *Firmament* acted the part it was commanded *of dividing the waters from the waters*.

AND as the Expanſion had this power from the Creator (for He firſt cauſed the motion in the

before

before dark ſtagnant air; that motion produced Light; that Light and that Spirit an *Expanſion*, &c.) and as it was now immediately under the influence of its *Maker*, and acted according to his Directions; ſo (and to prevent the *Iſraelites* from imagining it to be a God, and not the work of GOD, as the idolatrous nations did) *Moſes* adds, *And God* MADE *the Firmament; and divided the Waters which were under the Firmament, from the Waters which were above the Firmament.*

THIS is a further deſcription of things, in order to prevent our miſtaking *where* the *Waters divided*, and *where* the *Airs dividing*, were; and to prepare the reader for what was to follow. The *Expanſe*, as we have ſeen, acted from *above* and from *below*, and by forming the cruſt of the earth in the *midſt* of the waters, ſeparated the waters from the waters; which waters, thus ſeparated, would be in two diſtinct orbs; *one* [B. 1.] covering the *outward* ſurface of the earth, which therefore would juſtly be deſignated by *the waters under the* open *Air*, *Heaven*, *Firmament*, or *Expanſion*; in the ſame ſenſe as *the hills* (*Gen.* vii. 19.) are ſaid to be *under the heaven*; and as theſe waters then covered the whole ſurface of the earth, they were more immediately *under the heaven*. And as we have ſeen already, there was a body of *expanding air* at and round the *center* of the earth, ſo the *waters* [B. 2.] that were directly *above* this *inward* Expanſion, *i. e.* thoſe which were cloſe to the *concave* ſurface of the earth, would properly be denominated *Waters above the Air*, *Firmament*, or *Expanſion*.

THAT

THAT there was really a body of expanding air at and round the center of the earth (on which ſuppoſition the above interpretation depends; and ignorance of this has produced all the difficulty which this part of Scripture has been thought to labour under) is evident, not only from its being aſſerted, that the earth was *created* comparatively *hollow*, or filled *only* with *air*; but from the text under conſideration: For 1ſt. here is expreſs mention made of *two* Expanſes, and the operation of each, as I have ſhewn already, was *on* or *in* this earth. It is allowed by all, that *one* Expanſe acted on the *outward* or *convex* ſurface of the globe; the other therefore muſt be *within*, and act on the *inward* or *concave* ſurface. But 2dly. had there not been an Expanſion from within, or from *below*, as well as from *above*, there could have been no *ſeparation of waters from the waters*, or *the ſhell of the earth* could *not* have been *formed between the waters*; for had the *outward* Expanſe acted *only*, it would have driven the *ſolid parts* of the terraqueous maſs quite down to the center, in the ſame manner as it now precipitates mud, or any earthy ſolid ſubſtances, thro' the waters of the ſea; and in this caſe the earth would have been formed as a *ſolid ball*, or *kernel*, at the center; and all the water would have lain over it in *one united* maſs, in the ſame manner as the atmoſphere at preſent covers the earth. But there was a *Separation* of *waters from the waters, by the intervening ſhell of the earth, formed by the expanſive power of the Air*; and therefore there was an *inward Expanſion* as well as an *outward*.—

And

And as there was an *orb of water*, ſeparated from the *terraqueous maſs*, by this *inward Expanſion*, ſo it could be no otherwiſe diſtinguiſhed than by being called (as it is) *Waters above the Firmament*, or *Expanſion*.

But then a queſtion may be aſked, How ſhould this inward orb of water be ſuſtained, or kept cloſe to the inward or concave ſurface of the earth, and ſo be prevented from falling down to the center?—I anſwer, by the ſame means that the outward orb of water was kept cloſe to the outward or convex ſurface of the earth, or as the ſea is at preſent prevented from falling down through the clouds (*eſpecially* at our *antipodes*, to ſpeak as the vulgar would moſt naturally think) or from returning again to cover the earth (tho' the earth be revolved ſo immenſely ſwift on its axis)—all which is effected by the *compreſſure* of the *Expanſe*, or the *Air* acting on the *outward* ſurface of it; which Agent might as well keep waters *above* it as *under* it; for there is no ſuch thing as *innate gravity*, or *natural* tendencies of bodies to centers, &c. *All matter*, as our modern philoſophers allow, is *dead*, *inert*, *inactive*, quite *indifferent* to *every kind* of *motion*; and therefore cannot poſſibly *move* unleſs *impelled*; and *which way ſoever* it is *impelled*, either upwards, downwards, or ſideways, *thither* it muſt *move*. Sir *Iſaac Newton*, in ſeveral parts of his writings, ſpeaks of *Gravity* as being no more than *Impulſe*, and attributes the *Cauſe* of it to an *ætherial medium*, or *ſubtile fluid*[i]; which way ſoever therefore

[i] *Princ. Mat.* 3d. Edit. p. 147. 188. 488. *Optics*, p 323—29.

fore ſuch a fluid impels, that way muſt motion be. And with regard to *up* and *down*, or *above* and *below*, every child in philoſophy knows that they are only *relative* terms, reſpecting our ſituation upon the earth. No ſuch difference can properly be applied to the *inanimate* agents; which muſt of courſe act uniformly the ſame, *up* or *down*, juſt as they are placed, and have room to exert their power: and as at this time they were differently *ſituated* from what they are now — there being a body of expanding air at the center, as well as one upon the circumference of the earth — ſo each would produce the ſame effect on the ſide it acted againſt, *i. e. ſeparate* and *ſupport* an orb of water.

THE Earth being thus totally covered with water, the next requiſite ſtep would be to free its ſurface of this fluid, and permit *the dry land to appear*.

HENCE we read the next Command of GOD was — *And* GOD *ſaid, Let the water under the Heaven be gathered together unto one place*, [or *be united*] *and let the dry land appear*. The waters were before in *two* places; one orb [B. 1. in plate I.] covering the outward ſurface of the earth; the other [B. 2.] incloſed within its inward ſurface. The former of theſe muſt be gathered to the latter; that is, *the waters that were under the heaven*, or open air (*viz.* thoſe which were upon the outward ſurface of the earth, and which prevented the appearance of the dry ground) were to be gathered together to *thoſe beneath the earth*, which was the *only place* where there were *other* waters.

THE manner how this was effected by the

Agents

Agents then in Commiſſion may eaſily be conceived. As the matter of the heavens would be more and more melted down by the intenſe fire at the focus of the primæval light, ſo would the ſtrength of the Expanſion be increaſed, in proportion to the quantity of matter melted, and the degree of agitation; and how great its force muſt have been on this, the *third* day, may be partly gathered from the extent of its ſphere on the fourth, which reached by that time the other *orbs*, and even the *fixed ſtars*, as is evident from ver. 17. The Light and Spirit having ſuch an immenſe ſphere of action, and acting very powerfully near the earth (as is certain from the quick growth of *vegetables*, &c. on this, the *third* day) would preſs ſtrongly upon the outward ſurface of it; and by the continual and new admiſſion of light, through the ſhell to the central air, the *inward expanſion* would be vaſtly heightened and increaſed (in the manner deſcribed p. 56.) and by this means would be made to act more forcibly againſt the inward or concave ſurface of the earth. This force continuing to act with increaſed vigour would ſoon crack, cleave, and break the ſhell of the earth in many places, and ſo make room for the waters that covered the outward ſurface to deſcend, or be preſſed down through theſe cracks; and as the inward air went out, the outward orb of waters would ruſh in, and ſupply its place; and ſo be mixed or *united* with *the waters that were beneath the earth.* So that the two orbs of water [denoted by B. 1. and B. 2. in plate I.] would be *now joined*, and conſtitute

one

one Orb, or the *great Abyſs of Water*, [denoted by G. H. in plate II.] *at*, or rather *round*, the center of the Earth (for *immediately at* the center there would be a *Ball* or *Kernel* of terreſtrial matter, formed from what the Waters, in their deſcent from the ſurface and paſſage through the Strata of the earth, tore off, and carried down with them to the *loweſt place*: which *central Ball*, or *inner Globe*, is denoted by I. in plate II.) And thus *by the Waters under the Heaven* [B. 1. in plate I. or thoſe that once filled the Space E. in plate II.] *being gathered together to thoſe that were beneath the Earth*, [*viz.* H. in plate II. where was the *one place appointed for them all*] *the dry land would* of courſe *appear*, and the command be effected. [From this tranſaction we may alſo draw another argument in proof of the *inward Expanſe*; for had there not been ſuch a Space left within the earth, filled only with matter that would yield to the preſſure of other matter, and ſhift at its entrance, there would have been no place for the waters to retire to; but there was a place for the Waters to retire to, therefore there was ſuch a ſpace as the above-mentioned.]

VERSE 10. *And God called the dry Land*, [that which was at firſt immerſed in the waters, and wholly moiſtened by them, but now dry, hard, and prominent above them] EARTH [k]; *and the gathering*

[k] "אֶרֶץ the *earth*, as diſtinguiſhed from the *waters*. — As "the *Waters* are called יַמִּים from the Root הָמַם *tumult*, *confu-* "*ſion*, &c. on account of the *turbulent motion* of the Seas by "winds and tides, hence I conclude that אֶרֶץ muſt expreſs the "condition

gathering together [the whole collection] *of the waters, called He* [under the general name of] SEAS. [1] And thus would the *Earth* be *formed* much of the *ſame ſhape* it is *at preſent*, and as plate II. repreſents it.

FROM the deſcription here given how the Earth was at firſt formed, we may obtain an eaſy ſolution of the ſeveral ſeeming difficulties relating to the Deluge. For, firſt, we have here diſcovered where a body of water lies (*viz.* G. H. the great Abyſs) ſufficient to flood the Earth to an immenſe height, for but *part* of this water (*viz.* the orb G.) once covered its whole ſurface. And we have alſo diſcovered two very powerful Agents, *one* [*viz.* the *Spirit* or Air in a violent motion] capable of performing the grandeſt tranſactions by *preſſure*; the *other* [*viz.* the Light] capable of diſplaying immenſe power by *penetration*. We have ſeen that theſe two Agents (under GOD) ſeparated the Solids from the Fluids of this globe, drove them together into a *hard circular ſhell*, and permitted the *fluids* to ſlip on *each* ſide; and by renewed vigour, and redoubled power, cracked, cleaved, and broke this ſhell in various places, and ſo opened a way for the water that covered the outward ſurface of it to deſcend towards the center, and in its deſcent to channel and furrow the earth into hill and dale, and alſo to form and fill the larger cavities of Lakes and Seas,

" condition of the *dry land*, in oppoſition to תְּהוֹם *tumultuous mo-*
" *tion*, and conſequently muſt denote the *fixedneſs*, *hardneſs*, or
" *coheſion* of the Earth." PARKHURST's *Hebrew Lexicon*, p. 21.

[1] Ibid.

Seas, and by theſe means ſo diverſify the ſurface of this globe with high and low land, with ſtanding and running waters, as to render it a commodious and a pleaſant ſituation for its future inhabitants.

BUT as theſe inhabitants, about 1600 years after the formation of this beautiful ſeat, had greatly abuſed the goodneſs of the Maker, forgot the original Author of it, and deified the creature inſtead of the Creator; GOD determined, by inverting the order of Nature, to deſtroy them, and demonſtrate his power over the natural Agents to the future race of men, by bringing a flood of waters over the face of the whole earth, and ſo making the air deſcend into the place of the water, and the water aſcend into and occupy the place of the air, and by this means deſtroy that wicked generation in the moſt dreadful manner.

ACCORDINGLY GOD publiſhes his Declaration, *Gen.* vi. 17. *And behold I, even I, do bring* [MeBIA, am the cauſe or inſtrument of bringing] *a flood of waters upon the earth to deſtroy all fleſh*, &c.

AND as ſoon as *Noah* and his *righteous family* were entered into the ark, we are told—*The ſame day all the fountains of the great deep were broken up.*

WHAT the *great deep* is, we have ſeen already, and alſo that the orb of the earth ſurrounds it as a ſhell; and moreover have ſeen, that this ſhell was at firſt formed whole and entire by the *expanſive power* of the *air* or *firmament*, and by an increaſed ſtrength, or redoubled force of that power, was cracked and broken in various places,

in order to permit a quantity of water that covered its outward ſurface to deſcend into the inſide.

Now, an Agent, that could once by the direction of its Maker do this, could do the ſame at any time, when that divine Author pleaſed. The force of the natural perpendicular preſſure of the air upon the earth is known to be very great;[m] and its lateral or horizontal preſſure, as in caſe of high winds and tempeſts, will rend the rocks, and elevate the waters of the Ocean to a prodigious height. So that the Power of this Agent being preternaturally increaſed, and its force exerted upon the water of the Ocean, and of courſe upon that of the Abyſs (which is connected with it, and lies immediately under it) would cauſe thoſe waters to iſſue from their (before) confined ſtation, burſt open their common outlets or the paſſages for ſprings, fountains, *&c.* and flood the earth in proportion to the quantity of water emitted.

The Conſequence of ſuch an extraordinary Preſſure of the Air may be judged of from the *Effects* which a ſimilar preſſure of this Agent had upon the *waters* of the *Red Sea*, recorded *Exod.* xiv.

[m] The *Weight of Air* on every *ſuperficial Square Foot* is above 2000 "*Pound Weight.*"—And "ſince the Number of Square Miles on "the Earth's Superficies is computed 199250205, and in one Square "Mile are 27878400 Square Feet, the Square Feet on the Earth's "Superficies will be ſomewhat above 5547800000000000; whence "the Weight of the whole Atmoſphere, or its Preſſure on the Su-"perficies of the whole Earth, is more than 1109560000000000000 "Pounds, or much about 500000000000000 Tons; that is, "the Atmoſphere compreſſeth the Earth with a Force, or Power, "nearly equal to that of *Five-thouſand Millions of Millions of* "*Tons.*" See *Martin's Philoſophical Grammar*, page 180, &c.

xiv. 21, 22. xv. 8. when a *ſtrong Wind* [RUE, a violent S, F.. or Agitation in the Air] *drove back the waters* of that Sea, cauſed *the floods thereof to ſtand upright as an heap*, and *were a wall to the Children of Iſrael on the right hand and on the left, as they paſſed through.* Now a Continuation of ſuch a Force as this upon the waters of the Sea, and thoſe of the Abyſs, would certainly break open *the fountains of the Abyſs*, and raiſe the water above the Tops of the higheſt mountains, or to any height whatever. To one of the above acts the *Pſalmiſt* alludes, when he ſays *(Pſal.* xviii. 15.) *Then the ſprings of water were ſeen, and the foundations of the round world were diſcovered at thy chiding,* O LORD, *at the blaſting of the breath of thy diſpleaſure.*

THE effects alſo of a *ſtrong Wind*, or a *violent agitation of the Spirit*, are deſcribed 1 *Kings* xix. 11. when *Iſaiah* had an exhibition of ſome grand diſplay of the Power of GOD. *And behold the* LORD *paſſed by, and a great and ſtrong Wind rent the mountains, and brake in pieces the rocks before the* LORD; *and after the Wind* [as a conſequence of this violent agitation of the air] *an Earthquake*; and ſuch certainly there was at the *Diſruption* of the ſhell of the earth in the time of the deluge. " A very terrible event this (ſays a cer-
" tain Author) no leſs than the ſhell of ſtone
" broken up in many places, and ſhattered in all
" the reſt; all the Inlets, Under-Seas, Lakes,
" *&c.* made Fountains; and all the ſtrata which
" formed their ſides, and the ſides of the old
" Springs, thrown up unto the ſurface; ſpouts

" of vapours to darken the ſky, and vaſt ſpouts
" of water riſing like fountains, making a dread-
" ful noiſe; riſing in the ſea, and running to the
" ſea, and the ſea riſing and driving the people,
" *&c.* to the mountain tops, their laſt ſhift;
" where they with fright, rain, or hunger,
" periſhed; or thoſe, who ſurvived 'till the wa-
" ters came, were deſtroyed by them."

And thus alſo the beginning, proceſs, and completion of the deluge are deſcribed in the book of *Job*, ch. xxxviii. 8. *Who poured out* [n] (ſays God) *the ſea thro' doors, when it brake forth, as if it had iſſued out of the womb? When I made the Cloud* [groſs air] *the garment thereof, and thick darkneſs* [condenſed, ſtagnant air] *a ſwaddling-band for it* [this muſt have been at the time when the *flood* was *at the higheſt*, when the *inward Air* or *Firmament* (or the air which had preſſed upon and at laſt broke its way through the ſhell of the earth) had driven out great part of the water of the abyſs, occupied its place, and ſupported the remaining part of the water againſt the inward or concave ſurface of the earth; and when the *outward Air* or *Firmament*, ſurrounded and compreſſed the upper orb of water, cloſe to the outward ſurface of the earth]. *And then I brake up for it my decreed place*, [*i. e.* the ſhell of the earth which I had formed and eſtabliſhed between the waters; and by breaking this, permitted the upper waters to go to their *appointed place*; and when once retired thither] *I ſet bars and doors, and*

[n] from נסך *fudit, effudit, perfudit liquore aliquo.* Mar. Cal.

and ſaid, Hitherto ſhalt thou come, but no further; and here ſhall thy proud waves be ſtayed.

BUT what is more than all this, an *effect greater* than the *diſruption* of *the fountains of the Abyſs*, is That which follows,

And the windows of heaven were opened.

MR. HUTCHINSON is the only Author I know of, who has properly explained theſe words, I ſhall therefore give the reader his explication; *Moſes's Principia*, p. 70. " The *windows of hea-*
" *ven* have been taken for imaginary *falls of wa-*
" *ter* from *above the heavens*, from the *clouds*,
" from the *air turning into water*, &c. Synop.
" Crit. Tom. 1. p. 97. " *Cataractæ cæli*, &c. *i. e.*
" *The Cataracts of heaven*,—the *windows*, *holes*,
" *openings*, or *cataracts of* HEAVEN, *i. e.* of the
" AIR, as *Gen.* i. 7. *Iſai.* xxiv. 18." Crit. Sac. Tom. 1. p. 147. " *Nam Cataractæ, teſte Hiero-*
" *nimo*, &c. *i. e.* For a *Cataract*, according to St.
" *Jerom*, is a *hole in a wall*, ſuch as *ſmoak gets*
" *through*. *Iſai.* lx. 8. *as* doves אל ארבתיהם (by
" *Sym.* to their *doors*, θυριδας) to their *windows*.
" *Iſai.* xxiv. 18. *The windows of heaven were*
" *opened*;—li. 6. *The heavens ſhall vaniſh like*
" *ſmoak*. 'Tis plain, *Cataractæ* ſignify windows,
" holes, ſluices, or flood-gates, or cracks, or chinks
" in walls or buildings, ſuch as ſmoak paſſes
" through out of one houſe or room into another;
" or windows ſuch as pigeons go in at, or cracks
" or holes in the walls of great buildings or rocks,
" ſuch as pigeons creep into and harbour in.
" This word is moſt clearly compared, and is
" the very ſame they ſay it is. The *Airs*, and

" the *Abyſs of waters*, are each called God's
" *Storehouſe*; and the *wall* between them is the
" *Cruſt* of the earth, or *Shell* of the *Strata of ſtone*,
" in which there are *innumerable cracks*, through
" which the *fumes* or *vapours* or *mixtures with air*,
" like *ſmoak*, continually paſs at the ſame *paſſage*,
" ſometimes up for rain, *&c.* and ſometimes
" down." ° [So that the phraſe *windows of heaven* may

° Mr. Hutchinson, in his *Obſervations in the year* 1706, (1ſt. edit. p. 93.) remarks, (long before, I believe, he had any thought of interpreting the paſſage under conſideration in the manner he has done) " Through the cracks in the ſtrata the water alſo paſſes
" to ſprings.—In fair clear weather, when there is any *wind ſtir-*
" *ring*, and *motion* in the *Air above*, the *air below in mines* paſſes
" ſo ſenſibly at theſe cracks, as ſometimes to blow out a candle.
" But when the rains are riſing, the moiſture expels the air, and
" cauſes ſuch a ſcarcity of it, or elſe a want of circulation of that
" air, that the candles will not burn; and withal ſuch a ſenſation
" of heat to men, as ſcarcity of air, in other places, does.—It
" is plain, the air will be thus expelled out, and return alternately
" into theſe cracks, as the *Steams* that ſupply rain fill and quit
" them." The ſame is remarked by Dr. *Woodward*; and the free intercourſe between the *Air below*, and *our Atmoſphere* or *the air above*, through every cranny in the earth, is fully proved; and the alterations, or the riſe and fall of the mercury in the Barometer, are ſhewn to depend thereon; vid. his *Nat. Hiſt. of the Earth illuſ. &c. Tranſlator's Introduction*, p. 109—153. See alſo *Lowthorp's Abridgm. of the Phil. Tranſ.* Vol. II. ch. iii. and *Gaſſendi animad. in* 10um *librum Diogenis Laertii*, Vol. II. p. 1052.

I may here obſerve, with regard to the text under conſideration, that the word ארבת (tranſlated *windows*) is derived from the verb ארב which ſignifies to *lie in wait*, to *lurk privily in a den*, to *watch in a hole, under cover*; as *Pſalm.* x. 9. יארב he lieth in wait *ſecretly as a lion in his den*. *Job* xxxviii. 40. *The young lions abide in the covert to* lie in wait. And the word ארב ſignifieth *a den*, or *hole*, or *cave* in the rock, or *Job* xxxvii. 8. *Then the beaſts go into* dens [ארב]. And even the Septuagint Tranſlation of this word, καταραχται, includes much of the meaning of the *Hebrew*, as καταραχτης, is derived from καταρρασσω to *iſſue out*, to *break through*; and may be rendered the *place of rupture*, or *breaking through*; it alſo

may here be rendered *the paſſages of the Airs.*] —" In the narroweſt acceptation the *paſſages of* " *the*

alſo ſignifies a *Gate*, ſee *Scap. Lexi.* So that the *ſame idea* of a *hole*, *cave*, *paſſage*, *opening*, &c. is preſerved in all the above places, the context in each place determining the preciſe meaning of the word.

Hence other paſſages, which ſeem to differ, may be reconciled to this explication, as 2 *Kings* vii. 2. where, on account of an extreme famine, a Nobleman for diſbelieving the word of *Eliſha*, (who had foretold that there ſhould ſoon be a great plenty of flour and barley) — ſays, *If the* LORD *would make* windows [*openings*, *paſſages*] *in* [not *of*] *heaven*, [and through them pour down *flour* and *barley*, as he had heretofore *rained down manna upon the children of Iſrael*, Pſalm lxxviii. 23, 24.] *might this thing be?* So in *Iſaiah*'s deſcription of the final deſtruction of the Earth, ch. xxiv. 18. *For the Windows from on high are open, and the foundations of the earth do ſhake. The earth is utterly broken down, the earth is clean diſſolved, the earth is moved exceedingly. The earth ſhall reel to and fro like a drunkard, and ſhall be removed like a cottage, and the tranſgreſſion thereof ſhall be heavy upon it, and it ſhall fall, and not riſe again.* From this laſt particular it is evident, that the *final* diſſolution of the earth is here intended, which we are told by St. *Peter*, Ep. ii. chap. iii. 10. will be effected by *Fire*, and in the manner following; *The Heavens ſhall paſs away with a great noiſe, and the elements ſhall melt with fervent heat, the earth alſo, and the works that are therein, ſhall be burnt up.* From whence it is plain, that this conflagration will begin in the *heavens above*, when the heavens themſelves will, in a manner, be *opened*, *cleft*, and *divided*, and ſtreams of fire be poured down upon the earth, as was the caſe in the deſtruction of *Sodom* and *Gomorrah*; or elſe the Lightnings of GOD's wrath will be darted from *the clouds* that are *on high*, as from concealed *lurking-holes*, till the whole be conſumed. And again, *Malachi* iii. 10. where GOD, accuſing the *Jews for robbing him in his tithes and offerings*, promiſes (if they would repent) that *he would rebuke the deſtroyer that he ſhould not deſtroy the* FRUITS *of their ground*, and ſays, *Prove me now,—if I will not open you the* windows of heaven [*the paſſages of the Airs*] *and empty out a bleſſing, that there ſhall not be room enough to receive it.*

In the above quotation is the very ſame phraſe uſed as in the text under conſideration, and muſt be underſtood in the ſame ſenſe. The *Abyſs* is called GOD's *ſtorehouſe*; and the *fruitfulneſs of the earth* or *vegetation* depends much upon the *influences* thereof, or *water* ſent *from thence*, as any one may be convinced by conſulting the *Authors* juſt referred to, but I ſhall confine myſelf to

Scripture.

" *the Airs* are through *every fiſſure*, and between
" *every fragment* of Stone, and they are *ſo many*,
" that moſt ſorts of Stone are divided by *great*
" *cracks* into pieces of perhaps a ton weight, *&c.*
" —How far the parts were divided, and the
" cracks opened at firſt, is not to be determined;
" but they were opened, and the fragments diſ-
" tanced ſo wide, or in ſo many places, that the
" Airs went down into the Abyſs as faſt as the
" Waters came up, quantity for quantity. But
" the *Continuance* and *Repetition* of this force
" would by degrees reduce them ſmaller and
" ſmaller. If we carry this expreſſion of *the paſ-*
" *ſages of the Airs being opened* to the *utmoſt ex-*
" *tent*, the *Waters*, much more the *Airs*, paſs *be-*
" *tween*

Scripture. Ezekiel, comparing the proud *Aſſyrian* to a *flouriſhing Cedar* in *Libanus*, nouriſhed by the *ſubterranean waters*, ſays, (xxxi. 4.) *The* WATERS *made him great, the* DEEP *ſet him up on high with* HER *rivers* [ſo *rivers* proceed from *her*, the *Deep*] *running about his plants, and ſent out her little rivers unto* ALL THE TREES OF THE FIELD: *therefore his height was exalted above all the trees of the field, and his boughs were multiplied, and his branches became long,* BECAUSE OF THE MULTITUDE OF WATERS, *when he ſhot forth.* And the *Bleſſedneſs* or *Fruitfulneſs* of a land is attributed to the *Deep below* as well as to the *Heaven above*, Deut. xxxiii. 13. *Bleſſed of the* LORD *be Joſeph's* Land *for the precious things of* heaven, *for the dew, and for* the Deep *that coucheth beneath.* And *Gen.* xlix. 25. we have expreſs mention of *the Bleſſings of the Deep* or *Abyſs.* So that, with-holding or cloſing up the *paſſages* in the earth, through which the *waters*, *ſteams* and kindly *vapours* ariſe for *moiſtening* the *Earth*, and *nouriſhing* its *plants*, would certainly render a land *dry*, *barren*, and *deſolate*; and on the contrary, *opening* theſe *paſſages*, and permitting the vapours to aſcend, would greatly conduce to the *fruitfulneſs* or *bleſſedneſs* of a land.

The reader by viewing the *irregular black ſtrokes* in the figure of the ſhell of the earth, repreſented by F. in *Plate* II. may have a ſtill clearer idea what *theſe paſſages of the Airs* are, and how the Abyſs is the Storehouſe from whence they are ſupplied.

" *tween* the *grains* or *ſands* of *moſt ſorts of ſtone*;
" and perhaps it will at ſome time appear, that the
" parts of the Airs *paſs between* every *atom* of
" ſtone, and then the words imply a DISSOLU-
" TION, as it really was, though executed by
" degrees, as men, *&c.* were deſtroyed."

As there are other texts which mention the *Diſſolution* of the Earth, it may be proper to cite them; *Pſalm* xlvi. 1. *God is our refuge*;—*therefore will we not fear, though the Earth be* removed [BEMIR, be *changed*, be *quite altered*, as it was at the Deluge] *and though the mountains be carried into the midſt of the ſea*; *though the waters thereof roar, and be troubled, though the mountains ſhake with the ſwelling thereof*;—*God uttered his voice, the earth* MELTED [THeMUG, *flowed, diſſolved to atoms*[P]]. So *Job* xiv. 19. which I ſhall tranſlate nearly according to *Pagninus*'s verſion, that being the neareſt of any other to the original; *For truly the falling mountain diſſolved, and the rock* [the ſtrata of ſtone] *was removed out of its place. The waters daſhed the ſtones to pieces*; *and waſhed away the products of the duſt of the earth*: *and thou deſtroyedſt the hope of man.* Again; Chap. xxviii. 9. in which alſo I ſhall chiefly follow *Pagninus*'s verſion, *He ſent his hand* [the *Expanſion, his Inſtrument* or the *Agent* by which he *worked*] *againſt the Rock*; *he overturned the mountains by the roots*; *he cauſed the rivers to burſt forth from between the rocks* [or *broke open the fountains of the abyſs*]. *His eye* [ſymbollically placed for the *Light*] *ſaw* [paſſed through or between] *every minute thing* [every

[P] MAR. CALAS. נמס eſt *Diſſolutio & Diminutio.*

[every *atom* of ſtone, *&c.* and ſo *diſſolved* the *whole*]. *He* (at laſt) *bound up the waters from weeping* [*i.e.* from preſſing through the ſhell of the earth, as tears make their way through the orb of the eye-lid ; or, as it is related *Gen.* viii. 2. *he ſtopped the fountains of the abyſs and the windows of heaven*]. *And brought out the Light from its hiding-place* [*i.e.* from the inward parts of the earth from between every atom, where it *lay hid*, and kept each atom ſeparate from the other, and ſo the whole in a ſtate of *diſſolution* ; his bringing out theſe parts of the light, and finer air, which cauſed the Diſſolution, would of courſe permit the Agents to act in their uſual way, and ſo re-form the earth]. 2 *Eſdras*, viii. *O Lord, whoſe ſervice is converſant in Wind and Fire ; whoſe word is true ;—whoſe look drieth up the depths, and indignation maketh the mountains to melt away, which the Truth witneſſeth*, [which the word of God, and preſent natural ſtate of the Earth, bear witneſs to.]

I may here add (as I have done already with reſpect to the *notion of an Abyſs of Water within the earth*, and for the ſame reaſon, vid. p. 44.) the teſtimonies of ſome Heathen writers, and others, who, in their accounts of the deluge, have expreſsly mentioned *the diſſolution of the ſolid Body of the Earth* at that time.

Manilius (who, according to *Scaliger*, lived in the time of *Auguſtus)* deſcribes the *diſſolution of the Earth* in the following terms ; *(Aſtronom. Lib.* 4. *v.* 828.)

Concutitur

Concutitur Tellus validis compagibus hærens,
Subducitque ſolum pedibus; natat Orbis in ipſo;
Et vomit Oceanus Pontum, ſitienſque reſorbet,
Nec ſeſe ipſe capit. Sic quondam merſerat Urbes,
Humani Generis quum ſolus conſtitit Hæres
Deucalion. ———

The Earth now ſhakes, before tho' firmly bound,
And from their feet withdraws the treacherous ground.
The *melted Globe ſwims in itſelf:* the main
Spews up a Sea, and ſucks it in again;
Nor can the *great Abyſs* itſelf contain.
All nature thus was in confuſion hurl'd,
And *the Deep gorg'd itſelf with all the World.*
Deucalion only then remain'd behind
The Solitary Heir of all mankind.

Thus alſo *Virgil, Æneid. Lib.* xii. *v.* 204.

—— *Non ſi* tellurem effundat in undas
Diluvio *miſcens:* ———

Not tho' great *Jove* ſhould once again *diſſolve*
The Earth to Water, by a *Deluge* torn.

The Phraſe *tellurem effundere in undas,* may be thought by ſome to have been uſed by the Poet for the ſake of the verſe, under the figure *Hypallage*; but as this effect was *really* produced at the time of the deluge, I ſee no reaſon for this ſuppoſition. Certain it is, that *Seneca,* in the account that he gives of his Deluge, ſuppoſes the

Earth

Earth or the *Land* capable of *ſuch* a *diſſolution*. *Queſt. Nat. lib.* iii. *c.* 27.

" Solutis quippe radicibus, arbuſta procumbunt " & vitis, atque omne virgultum non tenetur *ſolo*, " quod *molle fluidumque* eſt:—Labant ac madent " tecta, & in imum uſque receptis aquis funda- " menta deſidunt, ac tota humus ſtagnat, fruſtra " titubantium fulcra tentantur. Omne enim fun- " damentum *in lubrico* figitur, & lutoſa humo " nihil ſtabile eſt." *i. e.* " Their Roots being " looſened the Trees and the Vine fall, and no " Shrub whatever maintains its ſituation in the " Soil, which is *now ſoft* and *fluid*.—The build- " ings fall, and are overflowed, and the waters " making their way to the deepeſt receſſes, the " foundations ſink, and the whole ground be- " comes a Bog. In vain are props applied to " things in ſuch a tottering ſituation. For every " foundation is in a ſliding ſtate, and there can " be no firmneſs in ground ſo quaggy." And then he goes on to deſcribe the effects of the deluge throughout the whole earth, and con- cludes the Chapter thus; *Scies quid deceat, ſi co- gitaveris orbem terrarum natare. i. e.* " If you " would have a right opinion of theſe things, you " muſt ſuppoſe the *whole Earth* to *ſwim*." And ſpeaking of the ſame deluge in Chap. 29. " Maximam tamen cauſam, ad ſe inundandam, " terra ipſa præſtabit: quam diximus eſſe *muta- " bilem*, & *ſolvi in humorem*." *i. e.* " The Earth " itſelf will afford the greateſt cauſe for its own " inundation: which we ſaid before was *change- " able* and *reduceable into a fluid*.—*Undare ergo*

" *terra*

" *terra debet—Incipiet ergo putreſcere, dehinc lax-*
" *ata ire in humorem, & aſſidua tabe defluere.*"
i. e. " It is neceſſary that the Earth ſhould be as
" capable of *undulation* as *Water.*—It will there-
" fore begin to *putrify*, and then paſs into a
" *fluid* itſelf; and by a *continual ſolution* be *abſo-*
" *lutely liquated.*" And again, Chap. 30. " Ad-
" jice nunc, quod immanes ſunt in abdito lacus,
" & multum maris conditi, multum fluminum
" per operta labentium. Undique ergo erunt
" cauſæ diluvio, cum aliæ aquæ ſubinfluunt ter-
" ras, aliæ circumfluunt, quæ diu coercitæ vin-
" cent, & amnes amnibus jungent, paludibus
" ſtagna. Omnium tunc mare ora fontium im-
" plebit, & majore hiatu ſolvet. Quemadmo-
" dum corpora noſtra ad egeſtum venter exhaurit,
" *quemadmodum eunt in ſudorem vires*; ita *tellus*
" *liquefiet*, & aliis cauſis quieſcentibus, intra ſe,
" quo *mergatur*, inveniet." *i. e.* " Add to this,
" that there are immenſe Lakes hidden from
" our eyes; great part of the Sea alſo lies con-
" cealed, and there are many Rivers which
" flow in ſecret. There will therefore be cauſes
" ſufficient for a Deluge on all ſides, ſince ſome
" Waters enter in under the earth, others ſur-
" round it, which having been long reſtrain-
" ed ſhall break out and overcome it, Rivers
" ſhall join with Rivers, and Lakes with Marſhes.
" Then the Sea ſhall fill the mouths of all
" Springs and Fountains, and looſen them to a
" great extent. As the belly in emptying itſelf
" *exhauſts our Bodies*, as our vital ſtrength *turns into*
" *Sweat*, ſo the *Earth* ſhall *diſſolve*, and without

" the

" the assistance of other causes, shall *find within*
" *itself* what shall *drown* it."

AGREEABLY to this Description of the matter, *Lucian*, or the *Author of the Book de Dea Syria*, in the account he gives of the *deluge*, says, Παντα υδωρ εγενουτο. *i. e. All things are become Water.*

So the *Pseudo-Sibyll*,

Υδωρ εσται απαντα, κ) υδασι ϖαντ' απολειται.

Water is all, and all Things are destroyed by Water.

Lycophron writes thus:

Οτ' ημαθυνε ϖασαν ομβρησας χθονα,
Ζην@ καχλαζων νασμ@. ——

When Jove, *in Tempests raging, storm'd the Earth,*
He dash'd the Whole into minutest Parts.——

" WHERE the Scholiast, *Is. Tzetzes*, expounds
" ημαθυνε by αμμον εποιησε, κατεκλυσε: and that very
" properly, since all *Stone* was reduced into *Sand*,
" and the *hardest* Bodies in the Earth into *soft*
" and *tender*. So that at the deluge, in such State
" of Things, as *Nonnus*, in his *Dionysiaca* (*Lib.* vi.)
" well observes,

—— Κοσμ@ ακοσμ@ εγενετο. ——

" *The World was unmade*, or *taken to pieces* [q]."

Philo-Judæus, speaking of the Deluge (*Liber de Abrahamo*, p. 279.) says, Τα μερη τ ϖαντ@ εις μιαν φυσιν της υδατ@ ανασ-οιχειωμενα. That *the Particles*

[q] Vid. WOODWARD's *Nat. Hist. of the Earth illustrated*, &c. p. 64.

cles of every thing were changed into the Nature of Water.

To proceed with the *Scripture-Hiſtory*;

VER. 12. *And the rain* [the vapours which were carried high up into the Atmoſphere, and formed into rain] *was upon the earth* [falling and ſubſiding] *forty days and forty nights.—And the waters increaſed, and bare up the ark;—and the waters prevailed and increaſed greatly upon the earth; and the ark went upon the face of the waters. And the waters prevailed exceedingly upon the earth; and all the high hills, that were under the whole heaven, were covered; fifteen cubits upward did the waters prevail, and the mountains were covered.* [r]

So that, there was *no high Hill* or *Mountain* upon *any part* of the earth which was *before* covered

[r] From mention being here made of *Mountains*, as ſubſiſting under the waters of the deluge, ſome have imagined that *They* were not, and of courſe that the *whole earth* was *not*, *diſſolved* during the flood. But ſuch ſeem not to conſider, that the *Diſſolution* (as obſerved above) was executed *by degrees*, as men, &c. were deſtroyed. It is ſaid indeed, that *on the day* that *Noah* entered into the ark ALL *the fountains of the Great Deep were broken up*; but it is not ſaid, that ALL *the windows of heaven*, or *all the paſſages of the airs* were opened on that day; and it does not appear that they were *all* opened, or the earth totally diſſolved 'till the *third* and *laſt prevalence* of the waters, or the event mentioned *ver.* 24, was effected; as the comment on that verſe will ſhew.

Another objection (not much unlike this, and taken alſo from the words of Scripture) to the *total diſſolution of* the earth during the Deluge, has been drawn from the *Moſaic* deſcription of the ſituation of *Eden*, and the names of the *lands* and *rivers* adjacent thereto (*Gen.* ii. 10, &c.) as exiſting under *thoſe appellations* in the time of *Moſes*. Now it has been argued, that if ſuch Countries and Rivers, and ſo called, exiſted in *Moſes*'s time, as did ſoon after the Creation of the World, then this part of World was *not deſtroyed* during

vered *with air*, but what was *now* covered *with water*; of courſe the *Deluge was univerſal.* But an irrefragable argument may be drawn from theſe words againſt a *partial* Flood, or an *univerſal* one effected by *partial* means, if I may ſo ſay, that is, by the waters firſt waſhing over one part of the earth, and then the ſame water proceeding on and overflowing another, and ſo ſucceſſively, 'till in the end the whole was drowned. For, according to Scripture, the water roſe *gradually* and *equally*, and at laſt *covered all the high hills and mountains* at *one* and the *ſame time*, ſo that the Flood could not have been of the above-mentioned *wandering* nature, as ſome, for want of knowing where a ſufficient quantity of water lay for flooding the whole earth, have falſly imagined.

BESIDES, it is altogether impoſſible to conceive, that the waters could have riſen to the height of *any high hill* under heaven, and not at the ſame time to have been of *equal height* over the *whole earth*; for the parts of water are diffuſive,

during the deluge. But why there might not have been *Lands* and *Rivers* ſimilarly ſituated, and called after the ſame Names *after* the Deluge, as they were before, I ſee no reaſon, or rather great reaſon, why all ſuch things ſhould be alike. For, certain it is (as I have amply ſhewn above) that the *ſame Agents* were employed in the Reformation of the earth *after* the deluge, as were concerned in the *firſt* formation of it, and alſo that they acted in *the ſame manner*, and under *the ſame direction*, and therefore may reaſonably be ſuppoſed to have produced *the ſame Effect.* So that the Earth, with regard to the *diſpoſition* of *Land* and *Water*, would be formed after the deluge, much as it was before, and of conſequence the ſituation of Countries, Rivers, *&c.* would be alike; and by the deſcendents of *Noah*, (who were acquainted with their former ſituations) would be *called after the ſame Names.*

ſive, having no tie or connection with each other; ſo that as they mounted upwards they would *ſpread* and *extend* themſelves *equally* on *all ſides*; and *at the ſame time* that they covered *one* high hill, they would of courſe cover *all others* of *equal height* over the *whole face* of the earth. For we are not to imagine, without a miracle of a moſt aſtoniſhing kind (which in this caſe is not to be admitted, becauſe not mentioned) that "a huge maſs of "water could have hung about any particular "part of the earth, as if congealed; or ſtood "upon the middle of it like one great drop, or "a trembling jelly, and all the places about it "dry and untouched," as an author obſerves; and then that this ſaid mountain of water ſhould be removed, or rolled to another place, and ſo on, 'till at length it had covered the whole earth. This ſhift, to avoid one real miracle, is only multiplying a number of others that never were effected; and I may juſt add here the obſervation of a judicious Divine, "that no man departed "from the common faith upon pretence of avoid-"ing any abſurdity therein ſuppoſed, but that he "ran himſelf upon the neceſſity of believing "greater abſurdities than any he pretended to "avoid."

WHAT is related above—that *the waters prevailed fifteen cubits upwards, and* (or according to the tranſlation of *Jun.* and *Tremel. after*) *the mountains were covered*—does not ſeem to be ſpoken to determine the preciſe height of the waters, but only to denote, that *all living creatures*

muſt have *periſhed* in *ſuch* a flood; for it immediately follows,

And all fleſh died that moved upon the earth, both of fowl, and of cattle, and of beaſt, and of every creeping Thing that creepeth upon the earth, and every man. All in whoſe noſtrils was the breath of life, of all that was in the dry land, died. And every living ſubſtance was deſtroyed, which was upon the face of the ground, both man, and cattle, and the creeping things, and the fowl of the heaven; and they were deſtroyed from the earth: and Noah only remained alive, and they that were with him in the ark.

THIS deſtruction of the land animals for the ſin of man, may, at firſt ſight, ſeem to carry ſome reflection upon the wiſdom and goodneſs of GOD, as a tranſaction unneceſſary and unjuſt. But certain it is, that the Creator has full power to diſpoſe of his creatures as he ſees beſt; and however unaccountable the diſpenſation may appear to us, yet it will always be conſonant to the rules of Juſtice and Mercy. And in this caſe it is manifeſtly ſo. For as theſe creatures were made for the uſe and ſervice of man, ſo when man was, in a manner, to be deſtroyed, it was neceſſary that they ſhould periſh together with him, as being of no farther ſervice: And not only this; but had they been preſerved alive (which muſt have been by a moſt extraordinary miracle) they would have been ſo very numerous after the flood, in compariſon of the few human creatures, that they would have defeated the very end for which they were made, by overpowering and deſtroying

ing the ſmall remnant of the human race. So that it was *neceſſary* and *proper* that they ſhould be deſtroyed, and begin again with man's re-beginning.

THE particular manner, in which the deſtruction of the brute creatures is notified, ſufficiently points out the *Species* that were to be deſtroyed, *viz.* the *land animals only*, as verſe 21. *All Fleſh died that* MOVED UPON THE EARTH—ALL *that* WAS IN THE DRY LAND, *died—every living ſubſtance was deſtroyed which* WAS UPON THE FACE OF THE GROUND, *both man, and cattle, and the creeping things, and the fowl of the heaven.* So that we may hence fairly conclude (eſpecially as *Noah* was ordered only, *Gen.* vii. 2, 3. to take pairs of the above ſpecies into the ark, *to keep ſeed alive upon the face of all the earth)* that the *fiſh*, or *the inhabitants of the waters*, were preſerved alive, without a miracle, in their own proper element. For though the firſt ſhock, *when the fountains of the great abyſs were broken up*, was very terrible, and probably deſtroyed great numbers of them, yet as many might have been preſerved as deſtroyed, as is commonly the caſe in the moſt tempeſtuous motions of the ſea. And after this firſt ſhock, we are told, the whole proceſs was *gradual*, both the increaſe and the decreaſe of the waters, ſo that with regard to any danger ariſing from the agitations of the waters, they may well be ſuppoſed to have been preſerved. But it has been further urged, that if they could ſurvive theſe, yet the great mixture of terreſtrial particles, when the whole body of the earth was diſſolved in the wa-

ters, muſt have produced ſuch noxious qualities, that it was impoſſible they ſhould have out-lived this injury, even in their own element. In anſwer to this, it muſt be obſerved, that the earth was not totally diſſolved, or the mountains reduced to atoms, 'till the waters had riſen to a vaſt height above them, (ſee p. 85.) So that there is no reaſon for ſuppoſing that the diſſolved parts of the earth reached to the ſurface of the waters; and even ſuppoſing that ſome part of them did, yet it is a well known obſervation, that in the moſt turbid mixture of earth and water, the earthy particles will ſoon begin to deſcend, and the ſurface become clear and limpid; and alſo, that in ſuch turbid waters, the fiſh naturally riſe to the top, which, in the caſe of the Deluge, would be the moſt advantageous ſituation poſſible for them, as the ſurface of the waters would abound with every thing ſuitable to their nouriſhment, as the carcaſſes of dead men and animals, and all ſorts of flying inſects; and the trunks of trees that ſwam upon the top would ſerve for the ſhelter of the Spawn and the Fry.

VERSE 24. *And the waters prevailed upon the earth an hundred and fifty days.*

As this is mentioned *after* the *mountains are ſaid to have been covered fifteen cubits* (which was only related to denote the *means* by which *all fleſh periſhed)* we may reaſonably ſuppoſe, that *the waters prevailed anew*, or continued to prevail, for *ſome time* at leaſt, *after* the *mountains were covered fifteen cubits*; eſpecially if we conſider, that there is no mention yet made of *the fountains*

fountains of the Abyſs, or *the paſſages of the Airs, being cloſed*; ſo that the waters were ſtill preſſed upwards, and reached in their real altitude far above *fifteen cubits* higher than the mountains; as many appearances in and on the earth undeniably evince.

It may be proper to remark here, that the *word* rendered *prevail*, ſignifieth ſomewhat more than the *bare increaſe* or *augmentation* of the waters, (though that idea is alſo included) for a diſtinct, and very proper word for the increaſe of the waters is uſed ver. 17 and 18, *and the waters* increaſed [IReBU, were *multiplied*]. And the word, which we render *prevail*, very juſtly has that meaning; it denotes *power*, *ſtrength to prevail*, *get the better of*, to *ſubdue*; ſo that by *the waters prevailing upon the earth* may be meant (eſpecially as this *prevalence* is mentioned *three* times, ver. 18, 19, and 24) the *total ſubduing* or *Diſſolution of the earth by the waters*: *Moſes* by this expreſſion giving us to underſtand, that the *waters* (in conjunction with the Airs) *had acted upon the earth in ſuch a manner*, *and affected it to ſuch a degree*, as to have reduced it to a *fluid looſe ſtate*; at leaſt, this muſt have been the conſequence of ſuch a prevalence of the waters; for, as the *paſſages of the airs* are ſaid to have been *opened*, and the *fountains of the Great Deep broken up*, BEFORE this *Prevailing of the waters*, it could not but be, that the waters, as they roſe *upwards* from the Abyſs, would make their way through *theſe Paſſages*, and by continuing and repeating this action, would ſeparate and widen the pores

of the earth, *undermine* and *diſſolve the mountains*, and, at laſt, reduce the whole maſs into a *fluid Colluvies*, or its *original unformed, chaotic* condition, mentioned *Gen.* i. 2. So that the Earth muſt *now* have been *totally diſſolved* in the *water*, and the meaning of the word מבול [DELUGE] compleated. "מבול (ſays Mr. *Bate* in his CRITICA HEBRÆA) ſignifies a *Deluge* or *Flood*, not from its "*overflowing only*, but from its *ſoaking* and *mixing with what it drowns*, as the waters did the "earth, quite through the ſhell of it; the *whole* "*ſhell of the earth* being *ſoaked full of water*, and "*diſſolved*, at *Noah*'s Flood."

VENGEANCE having been thus executed upon the wicked, a polluted earth deſtroyed and cleanſed by water; the next procedure would be to form it again. Accordingly we are told, ch. viii. 1. that GOD (who delights not in ſeeing things in diſorder, but pities when he diſtreſſes) *remembered Noah, and every living thing, and all the cattle that were with him in the ark.*

And God made a Wind [RUE, the *Spirit*] *to paſs over the earth, and the waters aſſwaged.*

THE ſame word, that is here rendered *Wind*, is tranſlated *Spirit*, in the account of the firſt Formation of things, (as I have already obſerved) *Gen.* i. 2. *And the Spirit of God moved upon the face of the waters.* And as the motion, then raiſed in the air by the *immediate power of God*, was the primum mobile, or chief cauſe, of bringing the Earth out of its chaotic ſtate into its intended beautiful form, ſo the ſame Agent is here employed in order to re-form the earth after its deſtruction

ſtruction or diſſolution during the deluge; and of courſe the ſame effects followed.——The Waters were before *increaſing* and *prevailing upwards*; but now they are *aſſwaged*, and prevented from extending their orb by the *paſſing of the Spirit over them*. The Spirit had before acted *through* the earth, and by its impulſe *broke open the fountains of the Abyſs and the windows of heaven*, but it was now made to act in its *uſual* way of preſſing *only* or *chiefly upon the ſurface*: things therefore would now be returning to their former courſe, and the ſame effects enſue, as had been largely deſcribed in the account of the firſt formation, and ſo needed not to have been repeated here.

HENCE we read in the next verſe, *The fountains of the Deep, and the windows of heaven were ſtopped, and the rain from heaven was reſtrained.*

THIS was no more than a conſequence of ſetting the Powers of Nature to work, as at the firſt. The earth had been diſſolved, and all the atoms of the ſtrata of ſtone floating looſe and irregularly in the waters; but as ſoon as the natural agents began to operate, as ſoon as the outward and inward Expanſe [*i. e.* the Light and the Air *without* and *within* the earth] began to act, to *make a diviſion between the waters*, they would drive all the *ſolid parts* of the earth together (much in the ſame manner as the ſame Agents at preſent ſeparate and impel the particles of ſlime and mud in dirty water) into a *ſhell* or *cruſt*, and permit all *Fluids* to ſlide between; ſo that there would be *two orbs of water*, and *one ſhell of ſtone*, or *the cruſt of the earth*,

between them; as things were circumſtanced on the *ſecond* day after the creation, *Gen.* i. 6, 7. when, by the *interpoſition of the ſolid ſhell of the earth, the waters were divided from the waters*, and the earth would be in the ſituation it is deſcribed to be in by St. *Peter* (2 Epiſt. iii. 5.) during the *height* of the *Flood*, *And the Earth ſtanding out of the water and in the water; whereby the world that then was, being overflowed with water, periſhed.*

THE account of the *deſtruction* of the earth, and of its *Re-formation*, mutually illuſtrate and confirm each other. In order to *deſtroy* the Earth, the *fountains of the Great Deep were broken up, and the paſſages of the Airs through the ſtrata opened*; but at the *Re-formation*, *Moſes* tells us, they were *both ſtopped* or *cloſed*, and even the *vapours for rain* prevented from riſing. So that the ſolid ſhell of the earth permitted neither the waters to deſcend, nor the vapours to aſcend; and of courſe the *Shell* muſt *before* have been *diſſolved to atoms*; for had it been only *broken*, or *fractured* into *large pieces*, it could not have been *ſo cloſed* or *joined together*, but that both *waters* and *vapours* would have *paſſed through*; and in this caſe it could not have been ſaid, that *the paſſages of the Airs were ſtopped.*

THE *ſhell of the Earth* having been thus *conſolidated* and *formed anew*, did not, and indeed could not, remain long whole and entire. For, as the Expanſe or Firmament had now received its full, if not new, powers of acting, the Light (which penetrates all terreſtrial bodies) would ſoon make its way through *the waters* and *ſtrata of ſtone* to the *comparatively thinner medium* or *air*

at

at the center of the earth (for it muſt be remembered, that the air, or that part of our Atmoſphere which at the beginning of the deluge was forced down into the Abyſs, drove out the waters from thence, and elevated them over the ſurface of the whole earth, would there continue as long as that elevation laſted, and ſo conſtitute an *inward Air* or *Firmament)* cauſe there a rarefaction, and ſo increaſe the force of the inward Expanſe, which by this means would act more ſtrongly againſt the concave part of the ſhell of the earth, and by continuing to exert and extend its power on all ſides from the center, would by degrees make ſmall cracks and crevices in the ſhell, and at laſt, by receiving new ſtrength and increaſed vigour, open and widen theſe cracks, ſo as to permit the water, that covered the ſurface of the earth, to be preſſed down through them into the Abyſs by the force of the outward Expanſe, as was the caſe at *the firſt Formation*. Hence it follows in the next verſe,

And the waters returned from off the earth continually.

In the verſe preceding, *the fountains of the abyſs and the windows of heaven were cloſed*, ſo that neither vapours nor waters could paſs; but here we find that the *waters* are *returning*, *i. e.* going back to the place from whence they came; they came, we ſaw, from the Abyſs, ſo that new inlets or apertures into the abyſs muſt now have been made for the deſcent of the waters, otherwiſe they could never have returned from whence they came, or have been *gathered into one* [and their former] *place*.

They

They returned from off the earth CONTINUALLY, or as tranſlated in the margin, *in going and returning*, in flowing backwarks and forwards, in fluctuating here and there; for as the Airs began to aſcend before the Waters began to deſcend, they would of courſe impede, and in part drive back the waters, and ſo cauſe a fluctuating or reverberating motion in them; and by this means alſo, the waters would be prevented from ruſhing down too faſt, and from tearing the ſhell of the earth too much. For had the apertures into the Abyſs been very large, and no impeding body to withſtand the deſcent of the waters, the ſurface of this earth would have been of a very different form than what it is now. For inſtead of the preſent *gentle riſings* and *fallings* of hill and dale (all which were made by the *gradual* retreat of the waters at the end of the Flood, as will appear in the proceſs of this Tract) the whole ſurface of the land would have exhibited the moſt frightful and tremendous aſpect of *inacceſſible Precipices*, *broken Rocks*, and *unfathomable Gulphs*: and the water that at preſent breaks out from Spring-heads on the tops and ſides of Mountains, inſtead of ſoftly gliding through the declining Vallies, would have broken in direct falls and cataracts over our heads: ſo much depended upon the *gradual* deſcent and *retreat* of the Waters. And an Author, who was well acquainted with the Subject I am writing on, ſays, " The waters " in their going down acted in the ſame manner " as they did at the *firſt Formation*; they formed " the Surface of the Earth (if one might uſe

" ſuch

" ſuch an expreſſion without offence) for *their* " *own uſe*, and in doing that formed it *for our* " *uſe*". *Hutchinſon's Moſes's Principia*, p. 106. And by this mutual and contrary action of the Air and Water, the body of the earth would not only be preſerved from being broken too much, but the *ſafety of the ark* upon the face of the Waters eaſily accounted for, without having recourſe to a *Miracle*, as ſome have done. For, how impetuous ſoever the deſcent of the Waters might otherwiſe have been, yet the counter-action of the aſcending air would certainly weaken its force; and however violent the effects of theſe two agents might have been upon the body of the earth, yet it muſt be remembered, that the *Ark went upon the Face of the Waters*, and was at a vaſt diſtance from the Place *where* this action was: and at the ſurface of the Waters there might have been, in a manner, a calm, or but a gentle fluctuation; in the ſame manner as when Water is let out of a funnel, or the orifice of a large and deep Veſſel, there is but little motion or undulation at the Surface, however violent and turbulent the effects of the deſcending water, and aſcending air, might be at the bottom. And notwithſtanding, according to the preſent Tranſlation of the Bible, we are told, *God made a Wind to paſs over the Earth*; yet this Wind could not be a common Wind, or an horizontal motion of the Air, for that would have agitated the Waters more than before; and we are further told, the conſequence of this wind was, that the *Waters were aſſwaged*, or prevented from being

riſen

riſen higher; a juſt and natural conſequence of the interpretation of the Words, as given p. 86. Beſides, *Moſes*, in his deſcription of the Deluge, is very particular in his Account of the *gradual increaſe* and *decreaſe* of the Waters, which gradual operation would greatly tend to the preſervation of the Ark. So that (notwithſtanding all imaginary Storms and Tempeſts, and an improper introduction of the Deity) we may juſtly credit what follows,

VERSE 4. *And the Ark reſted (in the ſeventh Month, on the ſeventeenth Day of the Month) upon the Mountains of Ararat.*

[AND being ſettled there was ſafe from all *ſubſequent* perturbations and agitations of the Waters.]

THE truth of this memorable Event is teſtified by *Chriſtian*, *Jewiſh*, and *Heathen Antiquity*, and by a Tradition at preſent remaining among the Inhabitants of the Country, as the reader may ſee at large, by conſulting the *Univerſal Hiſtory*, Vol. I. p. 239, &c.

VERSE 5. *And the Waters decreaſed continually until the Tenth Month: in the Tenth Month, on the firſt Day of the Month, were the Tops of the Mountains ſeen.*

VERSE 6. *And it came to paſs at the End of forty Days* (*Noah* wiſely judging, that notwithſtanding the Tops of the Mountains had appeared, yet the ſides of the Hills and the Vallies might have been overflowed with Water, waited *forty Days longer*) *that* Noah *opened the window of the ark which he had made. And he ſent forth a Raven,*

Raven, which went forth to and fro, [or, according to the *Hebrew*, was *in going forth* from the Ark, and *in returning to* the Ark, for the ſake of food as well as reſt] *until the Waters were dried up from off the Earth.*

VERSE 8. *And Noah ſent forth a dove from him, to ſee if the waters were abated from off the face of the Ground: but the dove found no reſt for the ſole of her foot, and ſhe returned unto him into the ark. Again he ſent forth the dove out of the ark. And the dove came in to him in the evening, and lo, in her mouth was an* olive-leaf [or *branch*, an *emblem of peace* [s]] *pluckt off: ſo Noah knew that*

[s] Some have imagined, from the circumſtance of the Dove's bringing *Noah* a leaf or branch pluckt from a tree, as a proof of the decreaſe of the waters, that this Tree muſt have been ſtanding upright, or in its original poſition; otherwiſe a branch pluckt from it could not have ſerved for ſuch a proof; and therefore, if the Tree was thus ſtanding on the ground, it muſt follow, that the earth was not totally diſſolved during the Deluge.

But ſuch ſeem not to have conſidered, that whether the earth was diſſolved or not (but that it was, I think, I have abundantly proved above) it had been impoſſible for any thing upon the ſurface, ſuch as houſes, trees, &c. to have withſtood the prodigious torrents of water that muſt have ruſhed down from the mountains, *after* they had been covered *far above fifteen cubits high*; but of all things, far leſs capable were *trees* and *vegetables* of withſtanding theſe torrents, becauſe as the waters had been out upon the ſurface of the earth for *ſeveral months*, it could not be, but that, by their irregular motions in flowing backwards and forwards, they muſt ſoon have diſſolved, liquified, or *diſſipated* the *vegetable mould*, and all *the looſe parts* on the *upper ſurface* of the earth; ſo that *all trees* would have *fallen* of courſe, as the *ground*, on which they ſtood, *gave way*: hence *Noah* could not but conclude (had he ever ſeen a common ſtorm, attended with violent rain) that — in ſuch an inundation as was That in his time, when GOD aſſured him, *he would deſtroy the whole earth*, all trees, &c. muſt have been thrown down upon the ſurface; and therefore if the Dove brought him a leaf from one, it muſt have lain along upon the ground; and ſo be as full a proof of

the

that the waters were abated from off the earth. And he ſtaid yet other ſeven days, and ſent forth the dove; which returned not again unto him any more.

VERSE 13. *And it came to paſs in the ſix hundredth and firſt year, in the firſt month, the firſt day of the month, the waters were dried up from off*

the abatement of the waters, as if it had been ſtanding upright. And that the olive-tree did thus lie, ſeems evident from the preſent ſtate of things on and near the earth's ſurface; it being very common to find prodigious numbers of trees lying juſt beneath the vegetable mould, in ſuch a manner as the waters ruſhing from the neighbouring mountains would naturally leave them.

But there is another ſolution to this difficulty, which, conſidering the emblematical ſtyle of Scripture, and the circumſtances of the caſe, may be thought more juſt than the former, though very reconcilable with that interpretation. As it is particularly mentioned that *Noah* ſtaid juſt *ſeven days* before each time of ſending out the Dove, ſo in all probability the *day* on which he ſent her out was the *Sabbath*; and the *time* of the day, juſt after he had performed religious ſervice; as he might moſt reaſonably think that would be the beſt for expecting a bleſſing or a favour from heaven. Accordingly, at the ſecond return of the Dove, the *divine ſignal* was brought—an *Olive-branch*, an *emblem of peace*, in token that the *waters were abated*, and the *fury* of GOD's wrath upon a *wicked world* was *ceaſing*, and that *joy and comfort* would ſoon ſucceed to the *afflicted righteous*. And unleſs this branch be looked upon as a *divine ſignal* and *providentially given*, it will be difficult to ſay what could induce the Dove to bring *any branch* at all—and why an *Olive-branch*—and that this ſhould be *particularly mentioned*; when ſaying that a *leaf* or *branch* was brought, had been ſufficient, without ſpecifying the *tree* from whence the branch was taken; unleſs ſomething particular had been intended thereby. And, that the *Olive-branch* was an *emblem* or *ſign* of *Peace*, *Friendſhip*, or *Abatement* of *Anger*, *Diſcord*, *&c.* throughout almoſt the *whole world*, ſee *Virgil*'s *Æneid.* Lib. viii. 116. & Lib. xi. 101. *Livy*, Lib. xxix. 16. *Polybius*, Lib. iii. And we learn from *Columbus*'s *Voyages*, chap. 101. that this Symbol was uſed even in *America*. So then *Noah*, as ſoon as he ſaw the *Divine Signal*, deciphered the meaning thereof, and knew *that the waters were abated*. In this view, it does not at all ſignify, whether the tree, from whence the branch which the Dove brought was pluckt, was *lying down* or *ſtanding upright*; for the *particular ſpecies* of tree ſpoke its own meaning.

off the earth: and Noah removed the covering of the ark, and looked, and beheld the Face of the ground was dry.

VERSE 14. *And in the second month, on the seven and twentieth day of the month, was the earth dried.*

THIS verse may seem a contradiction to the former: but it is not. The *drying up of the Waters* from *off the Face* of the *Ground* is one thing, and the *drying*, or *draining the body of the Earth* from the effects of the Deluge, till all the superfluous waters had returned into the Abyss, is another. The first would naturally precede the latter; and this latter might have been (as is here related) near *two Months* after the former. Which by the by (especially if we include the time from the *first appearance* of the *Mountains*, which was two Months before this) shews, that there was time sufficient, in a natural way, allowed for the production of *grass* and *herbage* over the *face of the Earth*, for the nourishment of the animals that should come out of the Ark.

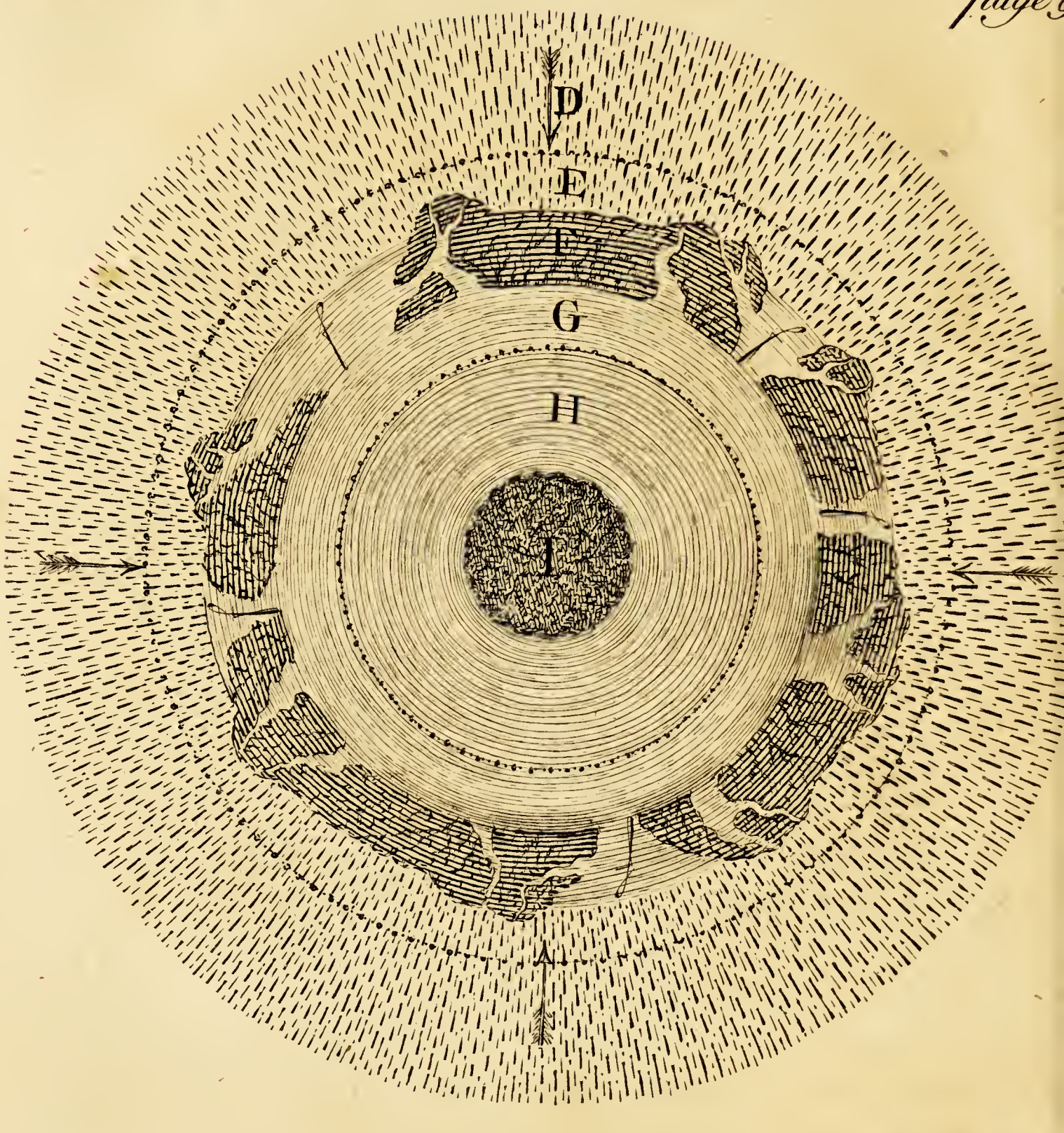
ALL things being thus graciously provided, we are told,

VERSE 15. *And God spake unto Noah* [as GOD had ordered *Noah* to enter into the ark at a particular time, so *Noah* waits the divine command for his coming out] *saying, Go forth of the ark, thou, and thy wife, and thy sons wives with thee. Bring forth with thee every living thing that is with thee, of all flesh, both of fowl and of cattle, and of every creeping thing that creepeth upon the earth; that they may breed abundantly in the earth, and be*

be fruitful and multiply upon the earth. And Noah went forth, and his ſons, and his wife, &c. And God bleſſed Noah and his ſons, and ſaid unto them, be fruitful and multiply, and repleniſh the earth.

HERE the *ſame bleſſing* for *repleniſhing the earth with men* is beſtowed upon *Noah* and *his family*, as was pronounced upon the *firſt pair* of the *human ſpecies*; and a *ſimilar declaration* made with regard to the *brute animals that came out of the ark* to be *fruitful and multiply upon the earth*, as had been done at *their firſt formation*: whence it muſt follow, that the earth, after the flood, was as entirely void of any living creature of the land or air (except thoſe that were preſerved by the ark) as it was before any ſuch were in being. And therefore the *Deluge*, in this reſpect, was unqueſtionably *univerſal*.

Plate II.



F: W: La Cave Scu

An Explanation of PLATE THE SECOND,

Repreſenting the internal ſtructure of the terraqueous Globe, from the center to the circumference, and the air around it.

D. The *outward Expanſe*, or *the open Firmament of Heaven*.

E. A *circular Space* filled with water during the height of the deluge, but now with the air that came from the central hollow of the earth; and at preſent conſtitutes what we call our *Atmoſphere*.

F. The *ſhell of the earth* broken into innumerable *apertures* and *fiſſures*, of various ſhapes and ſizes; the *larger* of which, f. f. f. f. f. being filled with the water that deſcended from the ſurface of the earth, conſtitute *ſeas* and *lakes*; the *leſſer* (which branch from the former, or paſs immediately from the under-part of the ſhell of the earth to the tops of the higheſt mountains) ſerve as canals for the water which ſupplies *ſprings* and *rivers* to run in; the *leaſt* of all (denoted by the *irregular black ſtrokes* in the ſolid ſhell of the earth) repreſent the cracks through which *vapours* principally aſcend.

G. H. The *great abyſs* of water within the earth; with which all ſeas, lakes, rivers, &c. communicate; and from whence they receive their ſupplies. G. H. are divided from each other by a dotted circle, becauſe *one of them* repreſents the water that, during the deluge, covered the whole ſurface of the earth, but which was afterwards forced down, through the above-mentioned larger apertures and fiſſures, to its original place, as the inward air was forced out thro' the leſſer and oblique fiſſures: and the *other of them* repreſents that part of the abyſs which, during the deluge, remained beneath the earth.

I. A *ſolid ball* or *nucleus*, of terreſtrial matter, formed from what the water in its deſcent from the ſurface, and paſſage through the ſtrata of the earth, tore off, and carried down with it into the abyſs, and repoſited at the loweſt place, the center of the earth.

☞ So that the opinion of the ancients concerning the earth's reſembling an *egg* has great propriety in it: for the central *nucleus*, (I.) by its innermoſt ſituation and ſhape, may well repreſent the *yolk*; the *abyſs* of water, (G. H.) which ſurrounds it, and is in a middle poſition, may ſtand for the *clear fluid* of the *white*; the *cruſt of the earth* (F.) (allowing only for its breaks and cracks) by its roundneſs, hardneſs, uppermoſt ſituation, and little inequalities on its ſurface, is juſtly analogous to the *ſhell*, and on this account the term, *the ſhell of the earth*, is frequently uſed in this treatiſe.

A

COLLECTION

OF THE PRINCIPAL

HEATHEN ACCOUNTS

OF THE

FLOOD.

PART II.

HAVING given at large an explanation of the *Moſaic* Hiſtory of the Deluge, I ſhall now ſubjoin the teſtimonies of ſeveral Heathen Nations in proof of the ſame fact. For, it may juſtly be ſuppoſed, that did any ſuch event really happen, it could not be but that all or moſt nations upon the earth muſt have retained ſome knowledge or tradition of it. And if upon enquiry it ſhould appear that the fame of the Deluge has gone throughout the whole world, that almoſt every nation upon the earth has ſome

ſtory or other to relate concerning it; it will certainly follow, that there has been ſuch an *Event*, and that it was *univerſal*. But of ſuch deductions and corollaries as theſe hereafter.

To collect all the evidence that might be produced on this occaſion, would be endleſs and needleſs; I ſhall therefore ſelect here and there particular accounts from the moſt eminent nations; and in gathering theſe, ſhall travel quite round the world.

I BEGIN with the great and famous nation of the *Romans*. Many of their writers, both Poets and Hiſtorians, make mention of an univerſal Flood; but one may ſpeak the voice of all. I ſhall take That of *Ovid*; who, purpoſing to relate ſome particular circumſtances of the hiſtory of mankind from the beginning, regularly proceeds from the formation of man, through the ſeveral ages of the world, to the time of the Deluge; the *cauſe* and *manner* of which (after having related the height of impiety and wickedneſs that reigned upon the earth during the *iron age*) he thus deſcribes, *Metam. Lib.* 1.

Neve foret terris ſecurior arduus æther, &c. i. e.

" Nor were the Gods themſelves more ſafe above;
Againſt beleaguer'd Heaven the *Giants* move:
Hills pil'd on hills, on mountains mountains lie,
To make their mad approaches to the ſky.
Till *Jove*, no longer patient, took his time
T'avenge with thunder their audacious crime;
Red lightning play'd along the firmament,
And their demoliſh'd works to pieces rent.

Sing'd

Sing'd with the flames, and with the bolts transfix'd,
With native earth their blood the monſters mix'd;
The blood, indu'd with animating heat,
Did in th' impregnant earth *new ſons* beget.
They, like the *ſeed* from which they ſprung, accurs'd,
Againſt the Gods immortal *hatred* nurs'd; [t]
An impious, arrogant, and cruel brood;
Expreſſing their Original from Blood.

Which when the KING *of* GODS *beheld from high* —
He *ſigh'd*; nor longer with his *pity* ſtrove;
But kindled to a *wrath* becoming *Jove*." —

" *Mankind's a monſter, and th' ungodly times,*
Confederate into guilt, are ſworn to crimes.
All are alike involv'd in ill, and all
Muſt by the ſame relentleſs fury fall." [u]

" Thus ended he; the greater Gods aſſent,
By clamours urging his ſevere intent;
The leſs fill up the cry for puniſhment.
Yet ſtill with *pity* they *remember man*,
And *mourn* as much as *heav'nly Spirits can*.

——————————— But *Jove*
Concludes to pour a *watry Deluge* down,
And what he durſt not burn, reſolves to drown.

[t] This anſwers to the *Scripture* account of the *Giants*, the *Apoſtates* (thoſe *rebels* to the *Will of Heaven* or *Word of God*) that were before the Flood, and to the *children*, the *ſons*, that ſprang from them, who were *worſe* than their Fathers, ſee *Gen.* vi. 1—5.

[u] *Gen.* vi. 12. *And God* LOOKED UPON *the earth, and* BEHOLD *it was corrupt; for all Fleſh had corrupted his way upon the earth. And it* REPENTED *the Lord that he had made man on the earth, and it* GRIEVED *him at his heart. And the Lord ſaid, I will deſtroy man whom I have created, &c. and bring a* FLOOD OF WATERS *upon the earth to deſtroy all fleſh, &c.* The reader, as he proceeds, may make many ſuch ſtriking reſemblances as theſe between Scripture and Heathen Hiſtory.

The Northen breath, that freezes floods, he binds,
With all the race of cloud-diſpelling winds.
The South he looſed, who night and horror brings;
And fogs are ſhaken from his flaggy wings.
With rain his robe and heavy mantle flow,
And lazy miſts are low'ring on his brow.
The ſkies from pole to pole with peals reſound,
And *ſhow'rs inlarg'd* come pouring on the ground.
——— *Impetuous rain* deſcends.
Nor from his patrimonial Heav'n alone
Is *Jove* content to pour his vengeance down,
Aid from *his Brother of the ſeas* he craves;
To help him with auxiliary waves.
The watry Tyrant calls his *brooks* and *floods*,
Who roll from moſſy caves (their moiſt abodes);—
The floods, by nature enemies to land,
And proudly ſwelling with their new command,
Remove the living ſtones, that ſtopp'd their way,
And guſhing from their ſource, augment the ſea.
Then with his mace their Monarch ſtruck the ground,
With *inward trembling* earth receiv'd the *wound*,
And *riſing ſtreams* a *ready paſſage* found.
Th' expanded waters gather on the plain;
They float the fields, and over-top the grain;
Then ruſhing onwards with a ſweepy ſway,
Bear flocks, and folds, and lab'ring hinds away.
Nor ſafe their dwellings were, for ſap'd by floods,
Their houſes fell upon their houſhold gods.
The ſolid piles too ſtrongly built to fall,
High o'er their heads behold a watry wall.
Now Seas and Earth were in confuſion loſt;
A world of waters, and without a coaſt.—

The

The moſt of mortals periſh in the flood;
The ſmall remainder dies for want of food.
A *mountain* of ſtupendous height there ſtands
Betwixt th' *Athenian* and *Bœotian* lands,
Parnaſſus is its name; whoſe forky riſe
Mounts thro' the clouds, and mates the lofty ſkies.
High on the Summit of this dubious cliff,
Deucalion wafting, moor'd his little *ſkiff*.
He with his wife were *only* left behind
Of *periſh'd man*; they *two* were *human kind*.
The mountain Nymphs and *Themis* they adore,
And from her *Oracles* relief implore.
The *moſt upright* of *mortal men* was he,
The *moſt ſincere* and *holy woman*, ſhe.
When *Jupiter*, ſurveying earth from high,
Beheld it in a lake of water lie;
That where ſo many millions lately liv'd,
But two, the beſt of either ſex, ſurviv'd;
He loos'd the *Northern Wind*; fierce *Boreas* flies
To puff away the clouds, and purge the ſkies:
Serenely, while he blows, the vapours driv'n,
Diſcover Heav'n to Earth, and Earth to Heav'n.—

DRYDEN."

FROM *Rome* let us proceed to *Greece*. I ſhall here take the teſtimony of *Lucian*, or the author of the book *de Dea Syria*, as it will include that of the *Scythians*, *Syrians*, and *Arabians*, as well as *Grecians*. Οι μεν ουν πολλοι Δευκαλιωνα, &c. i. e. "Many ſay that this temple [that at *Hierapolis* in *Syria*] was built by *Deucalion*, the *Scythian*; That *Deucalion*, I mean, in whoſe time the

greateſt inundation of waters was. I have heard in *Greece* what the *Grecians* ſay concerning this *Deucalion*. The ſtory they relate is as follows: The preſent race of men was not the firſt, for they totally periſhed; but is of a ſecond generation, which, being deſcended from *Deucalion*, increaſed to a great multitude. Now of theſe former men they relate this ſtory: they were inſolent, and addicted to unjuſt actions; for they neither kept their oaths, nor were hoſpitable to ſtrangers, nor gave ear to ſuppliants; for which reaſon this great calamity befel them: on a ſudden the earth poured forth a vaſt quantity of water, great ſhowers fell, the rivers overflowed, and the ſea aroſe to a prodigious height; ſo that *all things became water*, and all men were deſtroyed: only *Deucalion* was left unto a ſecond generation, on account of his prudence and piety. He was ſaved in this manner: he went into a large ark or cheſt which he had, together with his ſons and their wives; and when he was in, there entered ſwine, and horſes, and lions, and ſerpents, and all other creatures which live on earth, by pairs. He received them all, and they did him no hurt; for the Gods created a great friendſhip among them; ſo that they ſailed all in one cheſt while the water prevailed. Theſe things the *Greeks* relate of *Deucalion*. But, as to what happened after this, there is an ancient tradition among thoſe of *Hierapolis*, which deſerves admiration; *viz.* that in their country a great chaſm opened, and received all the water; whereupon *Deucalion* erected altars, and built the temple of *Juno* over the chaſm.

This

This chaſm I have ſeen, and it is a very ſmall one under the temple; whether it was formerly bigger, and ſince leſſened, I cannot tell; but that which I have ſeen is little. In commemoration of this hiſtory, they do this: twice in every year water is brought from the ſea to the temple, and not by the prieſts only, but *all Syria* and *Arabia*; many come from beyond *Euphrates* to the ſea, and all carry water, which they firſt pour out in the temple and afterwards it ſinks into the chaſm; which, though it be ſmall, receives abundance of water. And when they do this, they ſay *Deucalion* inſtituted the ceremony in that temple, as a memorial of the calamity, and of his deliverance from it." [w]

We will next paſs to *Egypt*; whoſe ancient inhabitants have retained the knowledge of the *Deluge* under the hiſtories of *Oſiris* and *Typhon*; as is evident from what *Plutarch* ſays concerning them in his *Iſis* and *Oſiris*. For firſt he informs us, p. 30, (of *Squire*'s edition) that they relate, " that when *Oſiris* was born, a voice was heard, " ſaying, *The Lord of all the earth is born*;" and p. 42. that " in their funeral-lamentation over him, they bewail'd him, *who was born on the right ſide of the world, and who periſhed on the left.*" p. 17. " He is ſaid to have been put into a cheſt," and they particularly aſſert, that it was on the 17th *day of the* month *Athyr* [ſee *Gen.* vii. 11.] and *thrown into the ſea.*" After theſe things, *Oſiris* is ſaid to have *returned* from the *other world*, and to

[w] Lucian *de Dea Syria*, Tom. II. p. 882. Vid. *Univer. Hiſtory*, Vol. I. p. 203.

to have appeared to his ſon *Orus*.—The perſon who thus uſed *Oſiris* is ſaid to have been one *Typho*,[x] which name the *Egyptians* explain by interpreting it the *Sea*, and they call *the ſalt of the ſea Typho's foam*, p. 42, and p. 54. Agreeable to this interpretation is what we are further told, "That *Typho* was once *in poſſeſſion* of the *portion* or *province* which *belonged* to *Oſiris*; by which they mean, that *Egypt* was once *covered* with the *Sea*. Which opinion, ſay theſe philoſophers, is probable enough, from that great number of ſea-ſhells, which are not only dug out of their mines, but found likewiſe upon the tops of their mountains; and hence likewiſe it is, that their fountains and wells, though many in number, have all of them a brackiſh or ſaltiſh taſte with them, as containing the vapid relics of the ſea-water, which once covered their whole country."

FROM *Egypt* we will proceed to *Babylon*, and ſee what the *Chaldæans* relate of the *Deluge*. I ſhall cite their teſtimony as preſerved by *Joſephus*, in the *firſt* book of his *Jewiſh Antiquities*, p. 10. Τȣ δε καταϰλυσμου τουτȣ, &c. *i. e.* "But of *this* [the *Noachian*] *deluge* and the *ark* all the *heathen hiſtorians* make mention; among whom is *Beroſus* the *Chaldæan*, who, relating the particular circumſtances

[x] The name *Typho*, according to ſome learned men, ſignifies a *Deluge* or *Inundation*; ſee JURIEU's *Doctrines and Worſhip of the Church*. Part. iii. Tr. 4. And *Typhon*, or as the Latin Poets call him, *Typhæus*, is repreſented as a monſtrous Giant warring againſt heaven; and who was at laſt overcome by *Jupiter*, and as one ſays, *lies now ſubmerſed in water*. APOLL. RHOD. ARG. Lib. ii. v. 1219. The *Arabs* at this day expreſs the *general Deluge* by the word *Al Tufan*. UNIVERSAL HIST. Vol. I. p. 200.

cumſtances of the Deluge, writeth thus, " It is reported, that part of the ſhip as yet remaineth in *Armenia*, on the mountain of the *Cordyæans*; and that ſome perſons taking off the aſphaltus [bitumen or pitch] carry it away; and that men make uſe of that which is thus taken off, by way of charm, to avert evil." And again, in his diſpute with *Apion*, he publickly appeals to the teſtimony of the ſame *Beroſus*, as being agreeable to that of *Moſes* (Book the 1ſt. p. 1044.) Ουτω τοινυν ὁ Βηρωσσω, &c. " Now this *Beroſus*, following the moſt ancient records, writeth the hiſtory of the Deluge, and of the deſtruction of mankind therein, juſt as *Moſes* hath related it; and alſo of the *Ark*, in which *Noah*, the Chief or Leader of our race, was ſaved when it was carried to the tops of the *Armenian* mountains." And if the *Babylonian Antiquities*, that now paſs under *Beroſus*'s name, be truly tranſlated from the Original (and I ſee no reaſon to imagine that they are not, ſince, as far as they remain, they are conſiſtent with, at leaſt do not contradict, what *Joſephus* and other writers have quoted from the Original [y]) his account of the Deluge is as follows, " *Ante aquarum cladem famoſam*, &c. *i. e.* Before that famous devaſtation of waters, in which the whole world periſhed, many ages had paſſed, which were faithfully remarked by our *Chaldæans*. They write, that in thoſe times there was a great city of

[y] I think what his Lordſhip ſays on this head in the *firſt part* of *his Vindication of the hiſtories of the Old and New Teſtament*, p. 121 — 128. juſtifies this aſſertion. *Beroſus* was a *Chaldæan* Prieſt; and lived about 270 years before the birth of Christ.

of Giants, called *Æno*, ſituated near *Libanus*, who governed the whole world, from the riſing to the ſetting of the ſun. Theſe truſting to the greatneſs of their bodies and ſtrength, and having invented arms, oppreſſed all, and being ſlaves to their luſt found out muſical inſtruments, and all kind of delights. They devoured men, and procured abortions on purpoſe to dreſs them for food; they promiſcuouſly lay with mothers, daughters, ſiſters, men and brutes; and there was no kind of wickedneſs which they did not commit; they were deſpiſers of religion and of the Gods. Then many foretold and propheſied, and carved out upon ſtones the things relating to that deſtruction which was ſoon to come upon the world. But they, following their old courſe, derided all ſuch admonitions, though the anger and revenge of the Gods were ready to fall upon them for their impiety and wickedneſs. There was one among the Giants who reverenced the Gods, and was more wiſe and prudent than all the reſt; his name was *Noa*; he dwelt in *Syria*, with his three ſons *Sem*, *Japet*, *Cham*, and their wives, the great *Tidea*, *Pandora*, *Noela*, and *Noegla*. This man, fearing the deſtruction which he foreſaw from the ſtars would come to paſs, began, in the ſeventy-eighth year before the inundation, to build a ſhip covered like an ark. Seventy-eight years from the time he began to build this ſhip, the Ocean of a ſudden broke out, and all the inland ſeas, and the rivers and the fountains burſting from beneath (attended with moſt violent rains from heaven for many days) overflowed all the mountains;

tains; ſo that the whole human race was buried in the waters, except *Noa* and his family who were ſaved by means of the ſhip; which, being lifted up by the waters, reſted at laſt upon the top of the *Gordyæan* mountain; of which, it is reported, there now remaineth ſome part, and that men take away the bitumen from it, and make uſe of it, by way of charm or expiation, to avert evil. —We muſt therefore allow from theſe premiſes, that which both the *Chaldæans* and *Scythians* write of, that, after the earth was dried from the waters, there were no more than the above-mentioned eight perſons in *Armenia Saga*, and that from theſe all men upon earth ſprung; and for this reaſon it is, that the *Scythians* juſtly ſay and call NOA the *father* of *all the greater* and *leſſer Gods*, the *author of* the *human race*, the *Chaos*, and *ſeed* of *the world*."

FROM the *Babylonians* we will go to the *Aſſyrians*. For whom let *Abydenus* ſpeak, whoſe authority is thus cited and publickly appealed to by *Euſebius*, Prepar. Evang. Lib. ix. Cap. 12. "Μεθ' ον αλλοι τε ηρξαν, ϰ᾽ Σεισιθρ@, &c. After whom others reigned, and then *Siſithrus*; to whom *Saturn* foretold that there ſhould be a great flood of waters (or many ſhowers) upon the fifteenth day of the month *Deſuis*; and ordered him to hide whatever writings he could find, in *Heliopolis*, a City of the *Sippari*. *Siſithrus*, having performed this, immediately ſailed towards *Armenia*; and inſtantly after, thoſe things which GOD had foretold came to paſs. And on the third day, when the tempeſt was ceaſed, he made a trial,

a trial, by ſending out birds, to ſee if they could eſpy any land uncovered of water. But they finding nothing but the immenſe Ocean, and not knowing which way to direct themſelves, returned to *Siſithrus*; and after theſe he ſent out others. That the third time it anſwered, for the birds returned with their feet all mudded. But as for *Siſithrus*, the Gods took him from among men. And the Ship was carried to *Armenia*, and afforded the people of the country amulets of wood, to diſpel diſeaſes."[z]

From *Aſſyria* we will paſs into *Perſia*. Dr. *Hyde*, in his *Hiſtoria religionis veterum Perſarum*, p. 171. writes thus, "*Veterum Perſarum orthodoxi credunt—diluvium, &c.* "The orthodox among the ancient *Perſians* believe a *Deluge*, and that it was *univerſal*, and overwhelmed the whole earth. But as they have various opinions and ſentiments concerning all thoſe things which are ſo remote in antiquity, they differ ſomewhat among themſelves and run into fables. For *Ibn Shabna*, the Arabian, in his book *de Primis & Poſtremis*, aſſerts, That there are ſome among the *Magi* who deny a Deluge;—others, he ſays, acknowledge it; but ſay that it was not univerſal, and

[z] That by the *Floods* of *Deucalion* and *Siſithrus*, as alſo that which is ſaid to have happened in the time of *Ogyges*, the ancients could mean no other than the *general Deluge* in the time of Noah, is abundantly evident from the relations themſelves; but if the reader is deſirous to ſee it circumſtantially proved, he may conſult the following Treatiſes, Bp. Stillingfleet's *Origines Sacræ*, Lib. iii. ch. 5. §. 5. Gale's *Court of the Gentiles*, Part. I. Book iii. ch. 6. Ray's *Three Phyſ. Theol. Diſcourſes*, p. 66. Kircher's *Arca Noæ*, Lib. ii. cap. 6. Grotius *de Verit.* Lib. i. cap. 16. Heidegger's *Hiſt. Patriar.* Exer. xviii. §. 43.

and that it did not reach beyond the top of a mountain near *Hulvan*, a city ſituated between the confines of *Aſſyria* and *Perſia*. From the opinion of *Zoroaſter* they maintain, that there had not been a Deluge, neither had the world been drowned, but for the iniquity and diabolical wiles of that moſt wicked of mortals, *Malcus*.—In the Book *Pharh. Sur.* the famous mountain, where *Noah* dwelt when the waters of the deluge broke out from it, is mentioned; and *Zala-Cupha* is ſaid to be the name of the old woman, from whoſe oven the waters firſt iſſued out."

From *Perſia* we will enter the *Eaſt-Indies*, which country being vaſtly extenſive, the inhabitants numerous, and of different ſects and orders, it is no wonder that ſome (as is aſſerted) deny a Deluge, and others affirm that there has been one. But if the tradition of it has reached this part of the world, it will be ſufficient for our purpoſe. Lord in his *Diſcourſe of the Banian Religion*, ch. vi. and vii. informs us, "That the *Bramins* ſay, that the four tribes, or caſts, of which the firſt race of men conſiſted, degenerating from their primitive innocence—the Prieſt neglecting his piety, the Soldier becoming inſolent and tyrannical, the Merchant practiſing deceit in trade, and uſing falſe balances, and the Artizan ſpending the profits of his inventions in riot and exceſs;—their impiety and wickedneſs grew at length to ſo inſufferable a height, that God's indignation was juſtly provoked, and he ſent a *Flood*, which *deſtroyed all nations without exception*. After which God, to repair mankind, created

created three perſons of greater excellency than thoſe of the former generation; to one of whom, named *Bremaw*, he gave the power of creating men and animals, which he executed accordingly: the firſt human pair proceeding, one from his right ſide, the other from his left. The man was called *Manow*, and the woman *Ceteroupa*, and by them was the earth repleniſhed."[a] Father *Bouchet*, ſpeaking of the *Indians*, eſpecially thoſe that live about *Maduras* and *Carnate*, writeth more largely thus,[b] "They ſay, that *Parabaravaſion*, i. e. *the Supreme God*, has created three inferior Divinities, viz. *Bruma*, *Vichnou*, and *Routren*. To the firſt he has given the power of *creating*; to the ſecond of *preſerving*; and to the third that of *deſtroying*.—The God *Routren*, who is the grand deſtroyer of all created beings, reſolved one day to drown all mankind, pretending he had juſt reaſons to be diſſatisfied with their behaviour. This deſign was not kept ſo ſecret, but it was found out by *Vichnou*, Preſerver of all creatures, who diſcovered the very day on which the Flood was to happen. Though his power did not extend ſo far as to ſuſpend the *execution* of what the God *Routren* had reſolved upon, yet, as he was the God-preſerver of all created beings, this gave him a right to prevent, if poſſible, the pernicious effects of it. The method he took for that purpoſe was as follows. He one day appeared to *Sattiavarti*, his great confident

[a] Univer. Hiſt. Vol. I. p. 229.

[b] See his *Letter* to the Biſhop of *Avranches*, printed in *Picart's Cerem. abrid.* p. 379.

confident, and privately aſſured him, that an univerſal Flood would ſoon happen; that the earth would be covered with water, and that *Routren*'s deſign was no leſs than that of thereby deſtroying all mankind, and every kind of animal. He nevertheleſs aſſured him, that he himſelf need not be under the leaſt apprehenſions; for that in ſpite of *Routren*, he would find opportunity to preſerve him, and to take ſuch meaſures, that the world ſhould afterwards be re-peopled. His deſign was to make a wonderful bark riſe up on a ſudden, at a time when *Routren* ſhould leaſt ſuſpect any ſuch thing, and to ſtore it with a large proviſion of ſouls and ſeeds of beings, eight hundred and forty millions at leaſt. As for *Sattiavarti*, he, at the time of the Flood, was to be upon a very high mountain, which he pointed out to him very exactly. Some time after, *Sattiavarti*, as had been foretold him, perceived a numberleſs multitude of clouds drawing together, but beheld with unconcern the ſtorm which was gathering over the heads of the guilty, when the moſt dreadful rain that had ever been ſeen poured down from the ſkies; the rivers ſwelled, and ſpread themſelves with rapidity over the ſurface of the whole earth; the ſea broke its appointed bounds, and mixing with the rivers, which now had left their channels, ſoon covered the higheſt mountains. Trees, animals, men, cities, kingdoms, were all drowned; in a word, all animated beings were inſtantly deſtroyed. In the mean time, *Sattiavarti*, with ſome of his penitents, had withdrawn to the appointed moun-

tain, where he waited for the ſuccour which God had promiſed him. However, this did not prevent his being ſeized with ſome ſhort intervals of terror. As the water gathered ſtrength continually as it rolled, and each moment drew nearer to his *Aſylum*, he was every now and then in a panic. But that very inſtant which he thought would be his laſt, he beheld the bark that was to ſave him: no ſooner did he ſet his eyes upon it, than he immediately got into it, with all the devotees in his company, and alſo the eight hundred and forty millions of ſouls and ſeeds of beings. The difficulty now was how to ſteer the bark, and to preſerve it from the impetuoſity of the waves, which raged with prodigious violence; but *Vichnou* took care of this; for immediately aſſuming the ſhape of a fiſh, he ſteered the ſhip with his tail, as though it had been a rudder. The god, who was now both fiſh and pilot, played his part ſo well, that *Sattiavarti* waited very quietly in his *Aſylum*, 'till ſuch time as the waters were run off from the ſurface of the earth."

We come now to *China*. Among whoſe Inhabitants we find the knowledge of the Deluge ſtill remaining; only ſome aſſert that it was but *partial*; though others maintain that it was *general*. The authors of the *Univerſal Hiſtory*, Vol. I. p. 204. (quoting *Anciennes relations des Indes, & de la Chine*, p. 67.) write thus, "An *Arab*, who travelled into *China* about the beginning of the ninth century, giving an account of a converſation he had with the Emperor, among other things, ſays, that mentioning the Flood to

that

that Prince, on occaſion of a picture of *Noah* which he ſhewed him, and telling him, that that prophet, and thoſe that were ſaved with him in the ark, peopled the whole earth; the Emperor laughed, and ſaid, "Thou art not deceived as to the name of *Noah*; but as to the *univerſal Deluge*, we know nothing of it. It is true, that the *Deluge* [ſo even theſe allow a *Deluge*] did *drown* a *part* of the earth; but it did not reach ſo far as *our country*, nor yet to the *Indies*." Which laſt circumſtance is juſt as probable, as what *thoſe* among the *Perſians*, who denied the *univerſality* of the Deluge, aſſerted, *viz.* that it reached no farther than *Hulvan*, a city on the confines of their country (p. 111). But we have already ſhewed the *impoſſibility* of *ſuch* a Deluge, (p. 80.) and therefore this confeſſion muſt be the remains of the Flood in the time of *Noah*. And that it really is ſo, or that the tradition of the Flood as held by ſome of them is the ſame with *Noah*'s, ſeems certain, becauſe (as *Martinius* obſerves, *Sin. Hiſt.* Lib. i. p. 12.) "The *Chineſe* hiſtory of the Deluge falleth in nearly with the *time* of the *Noachian*, for it preceded the common chriſtian æra about three thouſand years." Beſides, many reaſons may be given to prove that their firſt king, *Fohi*, was no other than the ſcripture *Noah*. For *firſt* (to uſe the words of Dr. *Shuckford* on this occaſion in his *Connect. of Sacr. & Prof. Hiſtory*, Vol. I. p. 29, 102.) "The *Chineſe* antiquities reach no higher than the times of *Noah*, for *Fohi* was their firſt King. Their writers in the general agree, that *Fohi* lived about 2952 years before

Chriſt: the Author *Mirandorum in Sina & Europa* computes him to reign but 2847 years before our Saviour, and *Alvarez Sevedo* places his reign not ſo early, imagining it to be but 2060 years; and all theſe computations agree well enough with the time of *Noah*; for *Noah* was born, according to Arch-biſhop *Uſher*, 2948 years, and died 2016 years before *Chriſt*; ſo that all the ſeveral computations fall pretty near within the compaſs of *Noah*'s life. And therefore we may conclude *Moſes*'s *Noah* and the *Chineſe Fohi* to be ſame perſon. But, 2dly, They ſay *Fohi* had *no father*, i. e. *Noah* was the *firſt man* in the poſtdiluvian world; his anceſtors periſhed in the Flood, and no tradition thereof being preſerved in the *Chineſe* annals, *Noah* or *Fohi* ſtands there as if he had had no father at all. 3dly. *Fohi*'s mother is ſaid to have conceived him *encompaſſed with a rainbow*; a conceit very probably ariſing from the *rainbow's firſt appearing* to *Noah*, and the *Chineſe* being willing to give ſome account of its original. 4thly. *Fohi* is ſaid to have carefully bred *ſeven ſorts* of creatures, which he uſed to *ſacrifice* to the *ſupreme Spirit of heaven and earth*; and *Moſes* tells us, that *Noah took into the ark of every clean* beaſt *by* ſevens, *and of fowls of the air by* ſevens. *And after the flood built an altar, and took of every clean beaſt, and every clean fowl, and* offered burnt-offerings. 5thly. The *Chineſe* derive the name of *Fohi* from his *oblation*, and *Moſes* gives *Noah* his name upon account of the grant of the creatures for the uſe of men, which he obtained by his *Offering*. Laſtly, The *Chineſe* hiſtory

tory ſuppoſes *Fohi* to have ſettled in the province of *Xeuſi*, which is the North-weſt province of *China*, and near to *Ararat* where the Ark reſted."

FROM *China* we will paſs into *America*, an immenſe tract of land unknown to us 'till lately; and yet when firſt diſcovered, the people thereof almoſt univerſally retaining the knowledge of the *Deluge*. *Acoſta*, in his *Hiſtory of the Indies*, (one of the firſt Treatiſes printed on the ſubject) Lib. I. c. xxv. ſpeaketh thus in general: "They [the American Indians] make *great mention* of a *Deluge*, which happened in their country: but we cannot well judge, if this Deluge were the univerſal (whereof the Scripture makes mention) or ſome particular inundation of thoſe regions where they are. Some expert men ſay, that in thoſe countries are notable ſigns of ſome great inundation; and I am of their opinion which think that theſe marks and ſhews of a Deluge was not that of *Noe*, but ſome other particular, as that which *Plato* ſpeaks of, or *Deucalion*'s Flood which the poets ſing of[c]: whatſoever it be, the Indians ſay, *That* ALL *men were drowned in this Deluge*. And they report, that out of the great lake *Titicaca* came one *Viracocha*, which ſtaid in *Tiaguanaco*, where at this day there are to be ſeen the ruins of antient and very ſtrange buildings, and from thence came to *Cuſco*; and ſo began mankind to multiply. They ſhew in the ſame iſland a ſmall lake, where they feign that the Sun hid himſelf, and ſo was preſerved, and for this

[c] See Note [z] p. 110, and what follows ſhews that it was a tradition of the *Univerſal Flood*.

reaſon they make great ſacrifices unto him in that place, both of ſheep and men. Others report that ſix, or I know not what number of men, came out of a certain cave by a window; by whom men firſt began to multiply; and for this reaſon they call them *Pacaritampo*. And therefore they are of opinion, that the *Tambos* is the moſt ancient race of men. They ſay alſo, that *Mango Cupa*, whom they acknowledge for the founder and chief of their *Inguas*, was iſſued of that race, and that from him ſprang two families or lineages; the one of *Havan Cuſco*, the other of *Hurni Cuſco*. They ſay moreover, that when the King [*Inguas*] attempted war, and conquered ſundry provinces, they gave a colour and made a pretext of their enterprize, ſaying, That all the world ought to acknowledge them; for all the world was renewed by their race and country: and alſo, that the true religion had been revealed to them from heaven."

BUT as *America* may be looked upon as a little world of itſelf, it may be expected that I ſhould be ſomewhat more explicit than giving a ſingle *general* teſtimony; I ſhall therefore traverſe it throughout, as I have done in relation to other parts of the earth.

AND firſt, for the upper or northern part of *America*. HENNEPIN in his *new diſcovery of a vaſt country in North-America*, (vid. *Continuation of the new Diſcovery*, &c. p. 54.) ſays thus, "Other Savages upon the ſame continent are of opinion, that a certain Spirit, called *Otkon* by the *Iroquois*, and *Atahauta* by the other barbarians at the mouth of

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the river St. *Laurence*, is the Creator of the world, and that one *Meſſou* repaired it after the *Deluge*. —They ſay, that this *Meſſou* or *Otkon*, being a hunting one day, his dogs loſt themſelves in a great lake, which thereupon over-flowing, covered the whole earth in a ſhort time, and ſwallowed up the world. They add, that this *Meſſou* or *Otkon* gathered a little earth together by the help of ſome animals, and made uſe of this earth to repair the world again."

FROM the nations of the *Iroquois*, &c. we will deſcend ſouthward to *Cuba*. ANTONIO DE HERRERA in his *Hiſtory of America from the firſt diſcovery thereof, with the beſt accounts the people could give of their antiquities, collected from the Original relations ſent to the Kings of Spain, tranſlated from the Spaniſh by Capt. John Stevens*, Decad. I. Book ix. c. 11. informs us, "That the people of *Cuba* knew that heaven, the earth, and other things had been created: and ſaid they had much information concerning the *Flood*, and that the world had been deſtroyed by water, by three perſons that came three ſeveral ways. Men of above ſeventy years of age ſaid, that an old man, knowing the Deluge was to come, built a great ſhip, and went into it, with his family and abundance of animals; that he ſent out a crow, which did not return, ſtaying to feed on the dead bodies; and afterwards returned with a green branch; with other particulars, as far as *Noah*'s ſons covering him when drunk, and the other ſcoffing at it; adding, that the *Indians* deſcended from the latter, and therefore had no coats nor cloaths:

but that the *Spaniards*, deſcending from the other that covered him, were therefore cloathed and had horſes. What has been here ſaid was told by an *Indian* of above ſeventy years of age to *Gabriel de Cabrera*, who one day quarrelling with him, called him *dog*; whereupon he aſked, Why he abuſed and called him dog, ſince they were brethren, as deſcending from the two ſons of him that made a great ſhip, with all the reſt that has been ſaid above. The ſame he repeated in the preſence of ſeverai *Spaniards*, after his maſter had reported it."

FROM *Cuba* we will paſs to *Terra-Firma*, the firſt country of *South-America*. The laſt cited Author acquaints us, *Decad.* xi. Book I. chap. iv. that the inhabitants of *Caſtilla del Oro* (in *Terra-Firma)* ſaid, " That when the *univerſal deluge* happened, one man with his wife and children eſcaped in a canoe, and that from them the world had been peopled; as alſo that there was one LORD in heaven, who ſent the rain and cauſed all the celeſtial motions. That there was likewiſe a very beautiful woman in heaven, with a child; but they went no farther, nor did they know any thing of their own original."

BORDERING upon *Terra-Firma* is *Peru*. " The ancient *Indians* (ſays the above cited Author, *Decad*, iii. Book XI. chap. i. ſpeaking of the *Peruvians)* reported, they had received by tradition from their anceſtors, that many years before there were any *Ingas* [Kings], at the time when the country was very populous, there happened a great Flood; the ſea breaking out beyond its bounds,

bounds, ſo that the Land was covered with water, and all the people periſhed. To this the *Guancas* inhabiting the vale of *Xauſca*, and the natives of *Chiquito* in the province of *Collao*, add, that ſome perſons remained in the hollows and caves of the higheſt mountains, who again peopled the land. Others of the mountain-people affirm, that all periſhed in the Deluge, only ſix perſons being ſaved on a float; from whom deſcended all the inhabitants of that country."

FROM *Peru* we will paſs into *Braſil*. NIEUHOFF in his *Voyages*, &c. to *Braſil*, p. 150. writes thus: " The moſt barbarous of the *Braſilians* inhabiting the *inland* countries ſcarce knew any thing of religion or an Almighty Being. They have ſome knowledge remaining of a general *Deluge*, it being their opinion, that the whole race of mankind were extirpated by a general Deluge, except one Man and his own ſiſter, who being with child before, they by degrees re-peopled the world." But *Monſ. Thevet* ſpeaking of the *Braſilians* that lived near the *ſea-coaſt*, viz. at *Cap de Frie* or *C. Frio*, gives their account of the Deluge very circumſtantially thus, (*Coſmographie univerſelle*, tome quatrieme, Livre xxi. cap. iv.) " *Le Deluge donc, que ces Barbares chantent & duquel m'ont ſouventefois parlé*, &c. The *Deluge* which theſe Savages talk ſo much about, and of which they ſpoke often to me, was in their opinion *univerſal*; they ſay, that *Sommay*, a Carribee of great dignity—had two children, the name of one was *Tamendonare*, the name of the other *Ariconte*, who were of different complexions and natures,

and

and therefore mortally hated each other.—*Tamendonare* (they ſay) was a good œconomiſt, having a wife and children, and took great delight in cultivating the earth: *Ariconte*, on the contrary, regarded not this, being ſolely bent on war, and deſiring nothing but to ſubdue by his power all the neighbouring nations, and even his brother. It happened as this warrior returned one day from the battle, he brought the arm of his enemy to his brother *Tamendonare*, telling him with great haughtineſs, go, coward as thou art, I ſhall have this wife and children in my power, thou art not ſtrong enough to defend thyſelf. *Tamendonare*, hearing his brother ſpeak thus, was very much grieved at his pride, and ſaid to him, If thou wert ſo valiant as thou boaſteſt, thou wouldſt have brought thine enemy entire. *Ariconte* incenſed at this reproach, threw the arm againſt the door of his brother's houſe; but at the ſame inſtant, the whole village, where they were, was carried up into the ſky, and they remained on earth. *Tamendonare* ſeeing this, whether out of aſtoniſhment or paſſion, ſtruck the ground ſo violently, that out of it iſſued a great ſource of water, which flowed ſo high, that in a ſhort time it reached the hills and mountains, and ſeemed to exceed the height of the clouds, and which continued till the earth was entirely covered. The two brothers ſeeing this, and ſollicitous to ſave themſelves, aſcended the higheſt mountains of all the country, and with their wives got upon the trees that were thereon. *Tamendonare* climbed up a tree, named *Pindona*, (of which there are

two

two ſorts, one whoſe fruit and leaves are much larger than the other) taking with him one of his wives: *Ariconte* with his wife climbed up another tree, named *Genipar*; that they might ſee if the waters were abated. Whilſt they were there, *Ariconte* offered ſome of the fruit of his tree to his wife, ſaying, break off a piece of this, and let it fall down; which being done, they knew that it was not yet time to deſcend into the vallies, and that the waters were yet very high. They aſſert, that by this deluge all mankind and all animals were drowned, except the two brothers and their wives; from whom afterwards ſprung two different people, called *Tonaſſearres*, ſurnamed *Toupinambaux*, and the *Tonaiatz Hoyanas*, ſurnamed *Tominous*, who lived in perpetual diſcord and war: hence alſo it is that the *Toupinambaux*, when they are deſirous of praiſing themſelves as above their neighbours, ſay, we are deſcended from *Tamendonare*, and you from *Ariconte*; as if by this they would infer, that *Tamendonare* was a better man than *Ariconte*."

THUS I have travelled quite round the world, and ſhewn that the fame of the Deluge has gone throughout. I am now to draw ſome concluſions or corollaries from what has been advanced. Theſe ſhall reſpect principally the *certainty* that there has been a *Flood*—that it was *univerſal*—that the *Moſaic account* is *true*, or written by one inſpired by GOD, the author of the Event.

FIRST, with regard to the *certainly* of the Flood, I may argue in the manner of *Ariſtotle*, "What ſeems true to ſome wiſe men is *ſomewhat probable*;

probable; what ſeems ſo to moſt or to all wiſe men is *very probable*; what moſt men, both wiſe and unwiſe, aſſent unto, doth ſtill *more reſemble truth*; but what men generally conſent in hath the *higheſt probability*, and approaches near to *demonſtrable truth*." Surely then, what men *univerſally* agree in, what, I may ſay, *all nations* (otherwiſe differing in opinion, cuſtoms, language, religion, and even ignorant of one another's exiſtence) have, throughout all known ages, aſſented unto, may well paſs for an *eſtabliſh'd axiom* and a *demonſtrable truth*. And ſuch I have ſhewn is the ſtate of the caſe with regard to the knowledge of the deluge.

AGAIN; the report of the Flood muſt have come from ſome quarter or other, and when or whereſoever it was firſt publiſhed, the relation of a fact ſo extraordinary, would naturally raiſe the curioſity of the firſt hearers, and excite them to inquire into the truth of it. Now if they diſcovered that the report was falſe or groundleſs, the hiſtory would have been immediately diſcredited, and the relater and his ſtory no more heard of: but the tradition prevailing *univerſally*, it is certain that ſuch an *event* did happen;—and moreover that it was *univerſal* in its effects, elſe it could not have been univerſally believed.

WHICH *(ſecond)* article is further evident from the afore-cited teſtimonies themſelves; for in all thoſe that are tolerably full and explicit, we find a method mentioned by which a few eſcaped out of the general deſtruction, from whom the world was afterwards peopled; which is a plain confeſſion,

feſſion, that according to their opinion the *whole race* of mankind (except the few allowed to be ſaved) was *deſtroyed*; and ſo the deluge *univerſal*.

But farther yet; an *univerſal deluge* is not an article of mere ſpeculation, or a point, the certainty of which might be proved only by properly examining the aſſerter thereof, but is an *Event*, or *Fact in Nature*, and of ſuch a *peculiar kind* that, did ſuch ever happen, it could not but have left undeniable marks of its exiſtence on every part of the earth; and ſo the relater of ſuch an event might have been confuted or his adverſaries convinced on the ſpot. Eſpecially was this confutation or confirmation eaſily to be eſtabliſhed in the firſt ages of the world; or rather, This is a point which could not but be then ſettled. For as men began to multiply after the flood, they would of courſe ſeparate and divide, and ſo repeople the earth; and as they thus ſeparated, they could not fail of knowing whether the Flood was univerſal or not. For, if they could find no human inhabitants in the countries to which they came, nor any marks of their former works, as houſes, palaces, temples, gardens, *&c.* and could ſee nothing but ruin and devaſtation in the things that did remain, they would certainly conclude that the deluge was univerſal: on the contrary, if, as they diſperſed or endeavoured to diſperſe, they found the neighbouring countries ſtill full of inhabitants, the lands cultivated, *&c.* they would as certainly conclude that the deluge had not been univerſal. And from this *infallible* and *unavoidable* means of knowing the truth, the relation

lation of the flood would have been handed down to poſterity; but poſterity all over the world ſpeak of it as univerſal, or allow that there has been a deluge, which comes to the ſame thing; for had it been partial, or extended only over a few countries, the remaining part of the world would have been utterly ignorant of ſuch an event, or at leaſt if they ſpoke of it, they would not have acknowledged, as they generally do, that it happened in their *own country*, and have ſuppoſed that a king, or an eminently righteous perſon of their *own nation* (including ſome others) was preſerved from the deſtruction. All this abundantly proves that the deluge was *univerſal*.

THE *certainty* and *univerſality* of the flood appearing thus evident,

I SHALL now *(thirdly)* make ſome obſervations concerning the *Truth*, *Perfection*, and *Divinity* of the *Moſaic* account.

FIRST, As Truth is the purer the nearer to the fountain head, ſo *Moſes* has the advantage of all other hiſtorians in this reſpect; none can preſume to equal him in antiquity; [d] he is allowed by all learned

[d] There is mention indeed made, *Joſhua* x. 13. *of the Book of* JASHER, and of the miracle of *the Sun's ſtanding ſtill upon Gibeon, and the Moon in the Valley of Ajalon*, being recorded in it; *Is not this written in the Book of Jaſher?* And as this event happened ſoon after the death of *Moſes*, ſome have imagined that the author of it muſt have been at leaſt coeval with *Moſes*, and that the Book of *Jaſher* muſt have been of great authority, as the Scripture itſelf refers to it for evidence. But, in ſhort, if we conſult the *original*, or even our *marginal verſion*, there will be no doubt of the author of the Book; for what is tranſlated, *Is not this written in the Book of* JASHER? is juſtly rendered in the *margin* of our Bibles, *Is not this written in the book of the* UPRIGHT? i. e. *in the word of God*, in the

learned men whatever to have wrote a conſiderable diſtance of time before them all.

AND as he lived nearer the event than any other writer, ſo is his relation more full and expreſs; nay, if you take all the above-mentioned heathen accounts together, and collect from them every different part, you cannot exceed the *Moſaic* in fulneſs of deſcription; far leſs can you do this, if you add to it the conſiderations I have mentioned p. 4, 5.

AND not only in fulneſs of matter does *Moſes* ſurpaſs, but in juſtneſs of thought and diction, and in the conſiſtency of the ſcheme he delivers. In the heathen hiſtorians there are many imperfections

the *authentic copy*, preſerved in the Temple, and acknowledged by all the nation.

And had the tranſlators rendered the words for *Sun* and *Moon* in the above paſſage, according to the ſenſe of the original, and according to common ſenſe, the *light of the Sun*, and the *light of the Moon* (as the words really mean) the charge of falſe philoſophy could not have been brought againſt Scripure. But we firſt of all make miſtakes ourſelves, and then wonder how they came to be in the word of God. Mr. *Pike* in his *Philoſophia Sacra*, p. 44, &c. has undeniably ſhewn, that the words שמש and ירח tranſlated *Sun* and *Moon*, really mean, in *every place* of Scripture where they occur, the *ſolar light* and the *lunar light*, and not the *bodies* of the Sun and Moon. And with regard to the paſſage under conſideration, he obſerves thus; "I conceive that the chief of this miſtake ariſes from quoting the place *imperfectly*. 'Tis uſually ſaid thus,—Does not *Joſhua* ſay, *Sun ſtand thou ſtill?* and the next words are generally dropp'd or forgotten: whereas it runs thus,—*Sun ſtand thou ſtill in* GIBEON, *and thou Moon in the Valley of* AJALON. Now I aſk, was the *body* of the Sun in *Gibeon*, or the *body* of the Moon in the Valley of *Ajalon?* Surely no: but the *light* proceeding from the Sun, and the *light* reflected from the Moon, were both *there*. *Joſhua* therefore plainly means not the *bodies*, but the *lights* of the Sun and Moon here." In the ſame ſenſe underſtand the word for *Sun* in *Pſalm* xix. and the whole will be *true philoſophy*.

fections of this kind, ſome failing in more, ſome in fewer articles. But *Moſes*, though he extends the duration of the Deluge far beyond what any of them do, and aſſerts its Univerſality in the higheſt degree, has yet provided againſt all exigencies; he ſafely embarks the numerous creatures in the ark, prepares every thing neceſſary for their being and well-being there, and as ſafely lands them.

As the heathen accounts differ more or leſs from the *Moſaic*, which was confeſſedly prior to them all, ſo we may aſſert of the relaters of them, as *Scaliger* is ſaid to write of the *Greek* hiſtorians, "They ought rather to be pitied for not having had the advantage of authentic antiquities and records, to ſet them right, than to forfeit their authority for ſuch deviations from the truth of the ſtory, as render their confirmation of the truth of the Sacred Hiſtory much ſtronger, becauſe much leſs to be ſuſpected, than if they agreed with it in every circumſtance." So that the imperfect, and, in many reſpects, falſe accounts of the Heathen, bear witneſs to the truth and perfection of that of *Moſes*.

But what diſtinguiſhes the *Moſaic* writings, and ſets them in an eminently conſpicuous light, and intimates their high Antiquity and Divinity, is, that in them there is no reference made, for the truth of what they contain, to any prior traditionary accounts, hiſtories, or records, as is the uſual manner with other hiſtorians; which kind of proof all mere human writers are glad to embrace, thinking nothing more venerable and true,

true, than that which has been delivered down to them from their forefathers. But *Moſes*, as greatly ſuperior to them in time, ſo much more in dignity and authority, demands audience from us as from GOD himſelf; he refers, for the truth of what he ſays, to an immediate Inſpiration from the Deity, the Author and Diſpoſer of all events; I AM, ſays, he (*Exod.* iii. 14.) *hath ſent me*; JEHOVAH HIMSELF commiſſioned him to act, and a *Thus ſaith the* LORD authoriſed him to write.

AND had not *Moſes* been thoroughly perſuaded that he was inſpired by GOD in his writings, he certainly never would have ventured the truth of all he ſays upon the aſſertion of a moſt improbable and aſtoniſhing fact, *viz. That the whole world had been deſtroyed by a flood of waters*;—a Fact, which he could not by any natural means have had proof of, unleſs he had travelled all over the world, or had received his information from one that had, which I believe no perſon will ſuppoſe any one to have done in thoſe early ages;—a Fact too, the truth or falſity of which could not but have been diſcovered, as mankind diſperſed to re-people the earth, or as commerce had opened a correſpondence throughout;—a Fact alſo, which *Moſes*, as a human writer, does not appear to have been under any neceſſity of mentioning at all; or if he thought proper to record it, he might not have made it ſo extenſive as he has done, and yet in all probability have ſaved his credit as an author. But, inſtead of all this, conſcious of Truth and of the unerring Wiſdom of his Inſpirer, he openly declares the *Univerſa-*

lity of the Flood, and that the whole world was deſtroyed, and leaves the iſſue to Providence, and the diſquiſition of the truth of his aſſertion to future ages. [e]

BUT what ſets *Moſes* in the higheſt point of view, and his writings on the firmeſt foundation, is his exerting ſupernatural powers, performing MIRACLES [f] and delivering PROPHECIES, in proof

[e] Some have aſked, *Why did not* NOAH *convey down to poſterity a true account of the Deluge, as he was preſent at the beginning and ending of it, and ſaw the whole tranſaction; he was certainly a more proper perſon than* MOSES, *who did not live 'till ſome hundred of years after the event?*

But ſuch objectors ſeem not to reflect on the ſituation of *Noah* during the flood, namely, that *he and all his family* were *ſhut up in the Ark*, and if they had been ſeated on the top of it, they could not have ſeen to any very great diſtance, at leaſt could never have known that the *whole globe* was *covered and environed with water:* neither could they have judged of the *amazing quantity of water ſent at that time from the abyſs beneath*; for though the water, in its paſſage upwards, would naturally elevate the ark to whatever height itſelf roſe, yet the perſons in it could not tell from whence it came, or to what height it aſcended: far leſs then could they judge of tranſactions that paſſed at a *ſtill greater depth* below them, namely, the *deſtruction*, *diſſolution*, and *re-conſolidation of the whole body* of the earth; all which were effected beneath the waters, inſcrutable to the human eye, thought, or concluſion, unleſs enlightened by revelation: ſo that *Noah*, though preſent during the event of the Flood, was as ignorant (conſidering his then ſituation in a natural light) of theſe great tranſactions, as any of us at preſent can be, nay more ſo, for our opportunities of ſearching and examining the Earth, and making deductions therefrom, are greater than his could be, and therefore he could not convey to us that knowledge which himſelf had not, unleſs he was informed of it *by Revelation*, which indeed he was, as I have proved already, p. 28. And if it were proper to give *Noah*, by ſupernatural means, any information of theſe things for his own and his family's ſake, certainly it was far more requiſite that *Moſes* ſhould be acquainted with them, who was to convey the *knowledge of theſe things*, and alſo ſome *far more uſeful Truths, to all Poſterity*, DEUT. XXIX. 29.

[f] That the miracles aſſerted in the Bible to have been performed by *Moſes* were really tranſacted as there related, and of courſe that the

proof of his divine Inſpiration; ſome of which are remaining at this day. I ſhall mention *one*, reſpecting the affair of the *Deluge*. *Moſes* writes thus, *Gen.* ix. 12. *And* GOD *ſaid, This is the token of the Covenant which I make between me and you, and every living Creature, for* PERPETUAL GENERATIONS: *I do ſet my* BOW *in the Cloud; and it ſhall come to paſs, when I bring a cloud over the earth, that the* BOW *ſhall be ſeen in the cloud: and I will remember my Covenant which is between me and you, and every living creature of all fleſh; and the waters ſhall no more become a flood to deſtroy all fleſh.* This Token we ſee is frequently exhibited, ſo that this *faithful Witneſs in heaven* [g] is ſtill preſerved. No flood has really yet happened (ſince that on account of which this promiſe was made) in which the whole earth has been drowned. Now if there be any God ſuperior to *Moſes*'s GOD, it behoves him to deſtroy this *Prophecy* by annihilating the ſign of it out of heaven, or the remembrance of it out of the mind of man, elſe it will remain an indubitable proof of *Moſes*'s Miſſion from the Supreme Being,

 —the

the doctrines delivered upon the authority of thoſe miracles are indiſputably true, or were of divine Inſpiration, the Reader may ſee a regular and ſuccinct proof of in the Rev. Mr. A. S. CATCOTT's *Sermons*, p. 131—48. It would be too tedious to introduce ſuch a proof here, and therefore the Author reſts the evidence of *Moſes*'s Inſpiration upon a Prophecy, relative to the Subject he is treating of, and which is exiſtent at this day, and affords ocular Demonſtration of *Moſes*'s Miſſion from the Divine Being.

[g] That theſe words of the *Pſalmiſt* (*Pſal.* lxxxix. 37.) are really to be underſtood of the *Rainbow*, (and not of the Moon, as uſually interpreted) appears to be ſufficiently evident from what the Author of *An Eſſay on the proper Leſſons, appointed by the Liturgy of the Church of England*, &c. ſays on this text, Vol. II. p. 87.

—the GOD of Heaven and Earth, the Creator, Former, and Preſerver of all Things in this world. —If it be ſaid, that the *Rainbow was exiſtent before the flood*; therefore the argument will not ſtand good: I reply, that ſuppoſing it to have been ſo, it could not have exiſted as a *Sign from the Supreme Being*, that a flood of waters ſhould never cover the earth (becauſe ſuch did cover it) and therefore it will not in the leaſt affect the argument here uſed; which does not reſpect its bare *natural State*, but its *ſuper-natural uſe* and *divine appointment*. And leſt it ſhould be imagined, that *Moſes* aſſigned this token as of himſelf, and to ſhew the folly of ſuch imaginations when men preſume to make appearances in heaven ſigns or tokens of things upon earth, without a divine direction, I ſhall here quote a Fact recorded by *Gaſſendus* in his *Animadverſions* on the *tenth book* of *Diogenes Laertius*, Tom. II. p. 938. "*Memorabile certe eſt*, &c. *i. e.* It is really worth remarking, what is written in the hiſtories, and in almoſt all the books of the laſt age; when the Aſtrologers, by reaſon of the many great conjunctions of the Planets, and not a few of them happening in the watry Conſtellations, foretold, that in the month of *February* in the year 1524, there would be a general Deluge, and ſo great a devaſtation of things, as was never heard of before: ſo that numbers of perſons in *France*, *Spain*, *Italy*, and *Germany*, being terrified with theſe apprehenſions, had prepared Ships, or had got together what proviſions they could, and other neceſſaries, and made to the higheſt places. But ſo it happened, that

that the whole month of *February* was the moſt ſerene and fair weather ever known; apparently, as if it had been ſo ordered on purpoſe for refuting the predictions of theſe Aſtrologers (when otherwiſe it is very unuſual, that the month of *February* ſhould be without rain;) which even *Cardan* and *Origan* [two noted judicial Aſtrologers of that time] could not deny; greatly grieving that this Judgment concerning the Deluge was declared by *Stæfler* ſo much to the infamy of Aſtrology." As long then as the above Appeal to the true GOD, and Challenge to all falſe Deities remains, ſo long will each ſucceeding age have undeniable proof, nay ocular Demonſtration of *Moſes*'s *Miſſion* from, and *Inſpiration* by, the GOD of all truth, power, and wiſdom. And when we conſider that this bold Appeal has been recorded in writing already above three thouſand years, and no detection yet made that it was falſe or unauthoriſed by the true GOD, we may juſtly ſuppoſe it will remain as long as the Heavens themſelves ſhall endure, *i. e.* to the Conſummation of all things.

On the Peopling of America.

AND this I think a proper place (before I have quite done with Scripture and ancient Hiſtory) to take notice of his Lordſhip's objection to the *Univerſality* of the Flood drawn from the *peopling of America*, and its being *inhabited with wild beaſts*, &c. when we firſt diſcovered it. To account for which he ſuppoſes, " that ſome parts of the habitable

ante-diluvian world, which by the force of the Deluge were ſeparated into iſlands, and were divided from the Continent whereon the Ark landed, were in ſome ſort exempted from the common calamity brought upon the reſt of the world, *&c.*" But how inconſiſtent this ſuppoſition is with his own deſcription of the Deluge, and with the truth of Scripture, I have ſhewed already (p. 12, *&c.*); and alſo obſerved, that ſuppoſing we could not ſolve this difficulty, yet a ſeemingly unaccountable event in Nature (or rather that which may appear unaccountable to ſome, but not ſo to others) ought not to ſet aſide the united evidence of Scripture, Reaſon, and Fact, concurring in all other reſpects to prove the Point under conſideration.

BUT to ſhew *how* or *by what means America* became inhabited by men and other animals.

AND here it will be neceſſary to premiſe a few things, introductory to the diſcuſſion of this article.

FIRST, then, *America* was peopled *after* the Flood. This is certain from the inhabitants thereof having the knowledge of that Event.

SECONDLY, Since the Tradition of the Flood was univerſally ſpread throughout that vaſt tract of land, and acknowledged by the ſeveral nations thereof to have been delivered down to them from the higheſt antiquity, we may reaſonably ſuppoſe, that it was peopled *ſoon after* the deluge; whilſt the knowledge of the Fact was freſh and lively upon the minds of the original inhabitants.

AND

And ſince, when this part of the world was firſt diſcovered by the *Europeans*, the inhabitants were found to be ignorant of the art of *writing* *with letters*, and could record things only in the *ancient hieroglyphical* way, by ſigns and emblems [h]; it ſeems alſo hence evident that it was peopled *early*.

Which will further appear from their ignorance of the art of *working iron* into uſeful tools or warlike weapons, 'till the method was diſcovered to them by the *Spaniards*. For though there is plenty of iron ore in *America*, yet the ancient inhabitants were ignorant of the uſe which the *Aſiatics* and *Europeans* make of it; and inſtead thereof uſed ſhells, bones, or generally hard ſtones, which with immenſe labour and trouble they ſhaped by grinding or whetting into the utenſils or weapons they wanted. [i] And though the art of manufacturing iron was known before the flood (*Gen.* iv. 22. [k]) yet it ſeems to have been loſt *ſoon after*; and the loſs was probably owing to theſe two cauſes; firſt, that as all the metallic and mineral bodies that were in the earth before the Deluge were deſtroyed, and even diſſolved, during that Cataſtrophe (as will be ſhewn hereafter) ſo of courſe all the inſtruments and utenſils that were made of theſe bodies periſhed likewiſe;

[h] Purchas's Pilgrimage, p. 811. quoting *Acoſta*, *Gomara*, *Peter Martyr*, &c.

[i] Dr. Woodward's *Letters, relating to the method of Foſſils*; Letter III.

[k] *And Zillah, ſhe alſo bare* Tubal-cain, *an inſtructor of every artificer in braſs and iron.* From this perſon's *Name* and *Office* was derived the fictitious Vul-can of the *Latins*.

likewiſe; which would certainly tend much towards obliterating the memory of ſuch inſtruments in the poſt-diluvian world. And ſecondly, ſince, for ſome conſiderable time after the flood, the inhabitants of the new earth would be employed, and their time wholly taken up in providing and ſecuring the common neceſſaries of life at firſt hand, or when they came to ſeparate from one another in travelling and ſeeking out agreeable countries to inhabit, ſo the art of mining and working metals, and ſuch like knowledge, (among their cares and concerns for many things immediately needful and abſolutely neceſſary) might be forgotten. And it ſeems certain, that this art was loſt, 'till ſome time after the flood; for there are found, even at this day, in almoſt all parts of the world, many inſtruments, ſuch as axes, chiſels, heads of arrows, *&c.* conſiſting wholly of *Stone*,[1] generally of the hardeſt kind; which certainly were made before the uſe of iron was recovered after the deluge, for they are neglected and diſuſed wherever iron is known. And ſince when we firſt diſcovered the *Americans*, they had no other tools or weapons but ſuch as were formed out of ſtone, *&c.* it is evident, that they departed from us before the working of iron was in practice after the Flood; for had they ever known this uſeful art, it is not probable that they would ever have loſt it, any more than ourſelves; and ſince we have retained it for theſe ſeveral ages back, even from time immemorial, it is certain that

[1] Woodward's Letters.

that the *Americans* departed from us even before that early time.

ANOTHER conſideration which may be brought in favour of the early peopling of *America*, is, that the inhabitants were ignorant of that noble and uſeful Structure the *Arch*, and even of building with *mortar* or any kind of *Cement*;[m] and yet their edifices conſiſted of Stones great beyond imagination,[n] and theſe Stones were ſo artificially wrought, and placed upon one another, that in many places their joinings were not viſible: "And that which is moſt ſtrange (ſays *Acoſta*), theſe Stones not being cut nor ſquared to join, but contrariwiſe very *unequal* one with another, both in *form* and *greatneſs*, yet did they join them together without cement, after an incredible manner: all this was done by the force of men, who endured their labour with an invincible patience." Certainly if they had known the uſe of mortar or cement, they would never have taken ſuch a tedious method as this. Now the firſt poſt-diluvian account we have of Cement being uſed in building was *at the Tower of Babel (Gen.* xi.) but as this, in all probability, was that pitchy ſubſtance called *Aſphaltus*, with which that Country *particularly* abounds; ſo unleſs the *Americans* had diſcovered a ſubſtance of a ſimilar nature in their new land, they might not think of making uſe of any other, and be as much at a loſs for what

[m] See ACOSTA's *Hiſtory of the Indies*, Book vi. chap. 14.

[n] *Acoſta* meaſured one of theſe Stones in a building, and it was 38 feet long, 18 broad, and 6 thick; which, I think, vaſtly exceeds any of thoſe that are now remaining in our ancient *Druidical* Temples.

what we now call *mortar* as if they had never heard of any thing like it. So that indeed we cannot conclude from hence, that they departed from us before the Building of *Babel*, but only before the *general uſe* of Mortar or Cement; and even this was very early, as the remains of the oldeſt Buildings in the world, ſuch as the *Pyramids of Egypt*, &c. teſtify, in which the mortar is viſible at this day.[o]

THE laſt circumſtance I ſhall mention, tending to prove the *Antiquity* of the *American* Colonies (for I might enlarge upon ſeveral, as their ignorance of coined money, the plough, the bellows, *&c.* all which would ſerve to ſhew that they departed from us in the very infancy of the poſt-diluvian world, before theſe arts were known to mankind) is, that they were ignorant of *Shipping*, or the art of making large veſſels with Sails, *&c.* till they firſt ſaw ours; knowing before no other kind of veſſels than ſmall *boats*, made of the bark of trees, ſkins of fiſhes, *&c.* or *canoes*, conſiſting of a ſingle trunk of a tree hollowed out by means of fire, and theſe to be directed only by the help of oars or a paddle.[p] From whence I would,

THIRDLY, obſerve, that *America* muſt have been peopled *by land*; for had the original inhabitants been carried thither in a Ship, either by diſtreſs of weather or deſignedly (both which are ſuppoſitions that can ſcarcely be allowed when we conſider the difficulties attending them) they certainly

[o] Dr. SHAW's *Travels*, p. 415.

[p] PURCHAS's *Pilgrimage*, p. 750, 755, &c. HEYLYN's *Coſmography*, p. 1016.

certainly would never have forgot that uſeful part of ſhipping, the *Sail*; even ſuppoſing that fabricating a large veſſel might be inconvenient or impoſſible to them when they firſt arrived on their new land, and therefore the knowledge of it be loſt to their poſterity; yet, I ſay, the uſe of the *Sail* would in all probability have remained among them, ſince it would have been of ſuch ſervice in navigating their ſmall canoes.

But what ſeems moſt to confirm the opinion, that *America* was peopled, or at leaſt ſtocked with animals, *by land*, is, that that vaſt Continent is every where inhabited by wild beaſts and the moſt noxious creatures, ſuch as Lions, Tygers, Rattle-ſnakes, *&c.* which we cannot imagine that any perſons would be at the trouble, or expoſe themſelves to the danger, of conveying over thither in Ships, and at the ſame time leave behind them ſuch uſeful creatures as the Horſe, the Camel, *&c.* which were not known in the *Weſt-Indies* 'till tranſported thither from us.[q] Nay, what is moſt remarkable, *America* has at preſent creatures peculiar to itſelf, ſuch at leaſt as are not known to exiſt in any other part of the world; which therefore cannot be ſuppoſed to have been carried from hence thither: and beſides they are of ſuch a nature that of themſelves they could not have croſſed the Seas, and therefore muſt have come thither by land.*

It appearing then thus clear, that *America* was peopled *early* and *by land*, the next queſtion to be ſolved is, *by whom* or *from what land?*

In

[q] Purchas p. 732—35. * Heylyn, 1017—19.

In order to ſolve which, let it be obſerved, that the ſacred and moſt ancient Hiſtorian informs us, in his account of mankind after the flood, that *the whole earth was overſpread by the deſcendants of the three Sons of Noah — Shem, Ham, and Japhet, who went forth of the ark*, Gen. ix. 19. From whence it is certain, that no part of the world could have been peopled by any other antediluvians than thoſe that went out of the Ark; and of courſe that *America* was peopled *after the Flood*, and by the Poſterity of *Noah*.

Secondly, Let ut conſider, that *Moſes* proceeds next to give us the *names* of the firſt deſcendants of theſe three Sons, and to mention the *names* of the *Countries* which the principal of them inhabited, eſpecially thoſe whoſe affairs would afterwards be mixed, or have ſome connection, with the Tranſactions related in the Bible, particularly with the *Iſraelitiſh* Nation. But as for the reſt he takes little or no notice of them.

So that, Thirdly, we cannot expect that any great notice ſhould be taken of the inhabitants of ſo diſtant a part of the world (from that where *Moſes* wrote, and the intent of his writing) as the Continent of *America*; and yet, one would be apt to imagine, that as He, who inſpired *Moſes* in his account, *ſaw all things from the beginning to the end* (and *who had made of one blood all nations of men for to dwell on all the face of the earth, and had determined the times before appointed, and the bounds of their habitations*, Acts xvii. 26.) ſo He would, in ſpeaking of the migration of mankind towards re-peopling the earth, make ſome mention,

tion, let drop ſome few words concerning the manner by which ſo large a part of the world, as the Continent of *America*, became inhabited.

And ſuch there is reaſon to think he has done, and left recorded in the following remarkable paſſage (the event denoted by which was ſo ſingular, as to give name to one of the poſt-diluvian Patriarchs; and is twice repeated in Scripture) viz. *Gen.* x. 25. 1 *Chron.* i. 19. *And the name of one (of Heber's ſons) was* Peleg, *for in his days was the earth* DIVIDED [NePeLeGE]. On which words that celebrated Biblical Critic *Bengelius* thus occaſionally remarks in his *Ordo Temporum*, p. 54. "*Peleg a diviſione terræ* nominatus eſt, *&c.* i. e. *Peleg* was named *from the diviſion of the earth* [which happened *in his days*];—The earth after the deluge was divided *by degrees*, by a *genealogical* and *political* diviſion, which is expreſſed by the words נפצה[r] and נפרדו.[s] But a very different kind of Diviſion is meant by the word נפלגה [NePeLeGE], namely, a *phyſical* and *geographical* diviſion, which happened *at once*, and which was ſo remarkable, and of ſuch extent, as ſuitably to anſwer the naming the Patriarch therefrom. By this word [PeLeG] *that kind* of *Diviſion* is principally denoted, which is applicable to *Land* and *Water*. From whence in the *Hebrew*

[r] As *Gen.* ix. 19. *Theſe are the three Sons of Noah; and of them was the whole earth* OVERSPREAD [נפצה].

[s] As *Gen.* x. 5. *By theſe were the iſlands of the Gentiles* DIVIDED [נפרדו] *in their lands; every one after his tongue, after their families, in their nations*; ſo alſo ver. 18, and 32; and ch. xl. 9. *From thence* [*from Babel*] *did the Lord* SCATTER THEM ABROAD [הפיצם] *upon the face of all the earth.*

brew tongue פלג [PeLeG] ſignifies a *River*, and in the *Greek* ΠΕΛΑΓΟΣ [PELAGOS] the *Sea*;" [and in the *Latin*, *Pelagus* denotes the ſame]. From this preciſe meaning of the word then we may conclude, that the Earth was *ſplit* or *divided aſunder* for a very great extent, and the *Sea came between*, in the days of *Peleg*. Now ſurely when any perſon views the ſituation of *America*, and conſiders how it ſtands disjoined from this part of the world, and what an immenſe Sea divides it from us, he will not be backward in allowing, that *This* was the *grand Diviſion* intended by the Paſſage under conſideration. And therefore we may juſtly ſuppoſe, with the above-mentioned writer, " That, ſoon after the Confuſion of tongues, and the diſperſion of mankind upon the face of the whole earth, ſome of the ſons of *Ham*[t] [to whom *Africa* was allotted] went out of *Africa* into that part of *America*, which now looks towards *Africa*; and the *earth* being *divided* or *ſplit aſunder in the days of Peleg*, they with their poſterity (the *Americans*) were for many ages ſeparated from the reſt of mankind. This ſeparation of the human race, by means of ſo large a ſea, prevented in like manner any evil and pernicious conſpiracy, as the Confuſion of tongues did."

And if this account can be ſeconded by any ſimilar event related in ancient Heathen Hiſtory, our ſuppoſition may deſerve a greater degree of credit.

[t] From what the *Indian* ſays to the *Spaniard*, p. 119, it appears, that the *Americans* themſelves retained ſome kind of tradition that they were deſcended from this Son of *Noah*.

credit. And ſuch an event we have recorded by *Plato* in his Dialogue named *Timæus*; in which he treats of *Nature*, or *the Syſtem of the Univerſe*, its generation or beginning, and the *Nature of Man*. And as a prelude to his Subject he makes mention of a Fact that happened in the moſt early ages, the neareſt of any known to the beginning of the world; and that is of a vaſt Tract of land, or an Iſland greater than *Libya* and *Aſia*, ſituated beyond the bounds of *Africa* and *Europe*, which, by the concuſſion of an earthquake, was ſwallowed up in the Ocean. *Plato* introduceth this fact, as related by *Solon* (one of the firſt of the ſeven wiſe men of *Greece*) who, while he was in *Egypt*, had heard it of an old *Egyptian Prieſt*, when he diſcourſed with him concerning the *moſt ancient* events. This Prieſt tells *Solon*, that the *Greeks*, with regard to their knowledge in antiquity, *had always been children*; and then informs him of the hiſtory of this famous Iſland (which they knew nothing of before): The deſcription of which and its cataſtrophe is as follows (which in itſelf is ſo remarkable, that there muſt have been ſome ground in nature for the tradition of it). "There was formerly an Iſland at the entrance of the Ocean, where the pillars of *Hercules* ſtand [and ſo beyond the then ſuppoſed bounds of *Europe* and *Africa*]. This iſland was larger than all *Libya* and *Aſia*; and from it was an eaſy paſſage to many other iſlands; and from theſe iſlands to all that Continent which was oppoſite, and next to the true ſea [αληθινου πουτου]. Yet within the mouth there was a gulf

with

with a narrow entry. But that Land, which ſurrounded the *Sea* called Πελαγος [PELAGOS, where the *Diviſion* was made] might juſtly be called a *Continent*.—In after-times there happened a dreadful earthquake and an inundation of water, which continued for the ſpace of a whole day and night, and this iſland *Atlantis*, being covered and overwhelmed by the waves, ſunk beneath the ocean, and ſo diſappeared: wherefore *that Sea* [Πελαγος] is now unpaſſable, on account of the ſlime and mud that has been left by the immerſed iſland."

THIS paſſage of *Plato* may receive ſome illuſtration, and the point I am upon, ſome degree of confirmation, from what occurs in the 18th ch. of the third book of ÆLIAN's *Hiſtory of various things*. " *Theopompus* relates a certain diſcourſe that paſſed between *Midas* the Phrygian and *Silenus*. This *Silenus* was the ſon of a Nymph, and was inferior to the Gods, but ſuperior to mortals. When theſe two had diſcourſed of many things, *Silenus*, above all, tells *Midas*, " That *Europe*, *Aſia*, and *Libya* ought to be conſidered as Iſlands, which the Ocean wholly ſurrounded; and that that part of the world, which lay beyond this, ought only to be eſteemed the *Continent*: as it was of an immenſe extent, and nouriſhed very different and vaſtly larger kinds of animals than this ſide of the world; and the men that inhabited it were twice as big."

FROM what has been offered, I think, we may conclude, that *Africa* and *America* were once joined, or at leaſt ſeparated from each other but by

by a very narrow gulf; and that ſome time after the Flood the earth was divided or parted aſunder, probably by means of an earthquake, and then this middle land ſunk beneath the Ocean.

ACCORDING to Scripture this event came to paſs *in the days of Peleg*, for we are told, that IN HIS DAYS *the earth was divided*. From whence ſome have imagined, this diviſion fell out exactly at the time of *his birth*; but the extenſive expreſſion of *his days* rather implies the contrary, and denotes that it happened when he was in an advanced age, when he had ſeen *many days*, not when he had ſeen but *one*. So that his name muſt have been given him *prophetically*, in the ſame manner as was *Noah*'s, under which was predicted an event which did not come to paſs 'till ſome hundreds of years after his birth (*Gen.* v. 29. viii. 21.) Several other of the Patriarchs alſo had ſuch prophetical names.

Now it appears from *Gen.* xi. 10,—17. that *Peleg* was born in the 1011ſt year after the flood, and lived 239 years: ſo that if the circumſtance, that cauſed his name to be given him, happened when he was in an advanced age, we may fairly ſuppoſe that it fell out about 300 years after the flood.

ALLOWING this diſtance of time, we ſhall find upon calculation, that there muſt have been a ſufficient number of mankind upon the earth to have re-peopled it abundantly. In order to ſhew this, and alſo in what manner the poſt-diluvians may be juſtly ſuppoſed, even in a natural way, to have ſeparated and diſperſed, and re-peopled

the globe, I ſhall tranſcribe ſome lines from the *Abridgement* of PICART's *religious Ceremonies*, p. 279. " 'Tis very probable, that *America* was as populous a few centuries after the deluge as it is at this time; after which States and Kingdoms were ſoon formed: however this was done progreſſionally, according as Families ſeparated, and that the children themſelves, becoming Parents of a numerous progeny, were obliged to quit their native countries. Theſe Separations gave riſe to States, in which ambition and a deſire of ſuperiority might even in thoſe ages have had ſome ſhare. Nevertheleſs 'tis probable that *Aſia* did not ſend out any colonies, 'till after having been forced to drive out ſuch young people as were capable of ſubſiſting by themſelves. But theſe Settlements were very eaſily made in thoſe times: huſbandry was then the only employment; mankind then ſpent their lives in leading their flocks to paſture; and 'tis by the opportunities which rural occupations gave to people, whoſe paſſions were as yet but in their infancy, that the firſt conqueſts were made in *Aſia*, and the ſending out of the firſt Colonies. A Shepherd, who was at the head of a numerous family, maſter of ſeveral flocks, and who found himſelf well ſettled in *Chaldea*, ſent one of his Children, or Dependents, ſeveral leagues off, with a detachment of oxen, aſſes, and camels. The flock went gently on, grazing in their paſſage, and inſenſibly drew farther from the true owner. In the mean time the Detachment grew more numerous; from this flock there ſprung another. The Shepherd, who

at

at firſt was no more than a deputy, became himſelf the Maſter and Father of a family: he then alſo ſeparated part of his wealth, and gave it as an inheritance to that Son whom he intended ſhould ſettle in a foreign country, or to ſome dependent that was going to ſettle farther off.

" We preſume that in this manner an hundred years was time ſufficient to people *Europe*, *Aſia*, and *Africa*, very conſiderably; and an hundred more, to people the Continent of *America*. Let us ſuppoſe for this purpoſe, that at the flood *Shem*, *Ham*, and *Japhet* had each twelve children [u], and that all theſe children were fit for marriage about fifteen or eighteen years after the flood. 'Tis very probable, that after they had been married twelve years, they might ſee a poſterity of four hundred and thirty-two perſons. In this manner *Noah* might have been at the head of above

[u] Leſt the ſubſequent Calculation ſhould ſeem unreaſonable, the reader is deſired to attend to the following, which is founded upon a Scripture-matter of fact. " It is evident from ſacred Hiſtory, [*Exod.* xii. 37.] that in the ſpace of about two hundred and ſixty-ſix years, the poſterity of *Jacob* alone, by his [twelve] ſons, amounted to *ſix hundred thouſand males* above the age of twenty, all able to go forth to war. Now by Mr. *Graunt*'s obſervations on the bills of Mortality it appears, that about $\frac{34}{100}$ are between the ages of ſixteen and fifty-ſix: which may be near the proportion of *males* numbered to the *entire number* of them all. So that as 34 is to 100, by the Golden Rule, muſt *ſix hundred thouſand* be to the *entire number* of the males of *Iſrael* at that time: which was therefore *one million ſeven hundred ſixty-four thouſand and ſeven hundred*. To which add *females*, near $\frac{1}{15}$ fewer, as ſuppoſe, to make the ſum even, *one million ſix hundred thirty-five thouſand three hundred*, the *Total* is, *Three millions and four hundred thouſand*; add forty-three thouſand for the *Levites* (not included in the former accounts), the *entire ſum* will *at laſt* amount to *three millions, and four hundred forty-three thouſand* ſouls." Whiston's *Theory*, p. 250.

above five hundred deſcendents in the ſpace of thirty years; and if we then ſuppoſe that every one of *Noah*'s great grand-children had ten children, theſe four hundred thirty-two perſons might have begot four thouſand three hundred and twenty children in ten years time. All this might have happened in the ſpace of half a century; ſo that multiplying them always by ten, and leaving an interval of about twenty or twenty-five years between one generation and another, *Aſia*, *Europe*, and *Africa* may have been peopled with *four hundred thirty-two millions* of inhabitants, an *hundred and fifty years* after the flood.

"METHINKS this could not be diſputed, were we only to have regard to the ordinary methods of propagation. 'Tis true indeed, that we ſuppoſe every Head of a family to have had ten children, when probably ſeveral of thoſe Chiefs might not have had near ſo many. But then how many do we ſee in our days who have more than ten? and if we conſider what Bp. *Burnet* has told us concerning Meſſ. *Tronchin* and *Calandrin* of *Geneva*; the former of whom, at the age of ſeventy-five, had one hundred and fifteen children, or perſons married to his children, that could call him Father; and the other, at the age of forty-ſeven, had one hundred and five perſons who were all his nephews or nieces by his brothers or ſiſters: if, I ſay, we conſider theſe two inſtances, 'twill be found that our computation is modeſt enough, for an age when poverty and the cares of life had not yet deſtroyed man's vigour, nor reduced him to the neceſſity of refraining from marriage

marriage (the lawful method of propagation) for fear of not being able to ſupport his family. But although the increaſe of our ſpecies had for one hundred and fifty years been much leſs than we have ſuppoſed it, and that only *four hundred millions* of people had came into the world; nay farther, though we were ſtill to ſubſtract *thirty millions* from that ſum, for the immature and violent deaths, diſeaſes, and wars, which in all probability were not ſo bloody in thoſe ages as they have been ſince, 'tis very natural to think that ſome *millions* might detach themſelves from the remaining *three hundred and ſeventy millions*, in order to ſeek their fortunes in *America*. And though we afterwards ſuppoſe, that propagation may have been very much prejudiced by reaſon of the fatigues they laboured under in their voyage, and from the change of climate, *&c.* we ſhall nevertheleſs find that *ten* or *twelve millions* of people may have been able to furniſh *America* with *forty millions* of ſouls, in *fifty years time*. What is here advanced ought not to be looked upon as a paradox, nor ſhould any difficulties be raiſed with reſpect to our calculation; difficulties which are founded only on the length of man's life in *our days*. Mankind in thoſe ages had not invented all thoſe pernicious arts, which, at the ſame time that they ſhorten life, do alſo leſſen propagation."

And if to all this we add the conſideration of what we are told in *Gen.* ix. 1. *viz.* That God, immediately after the deluge, *bleſſed Noah and his ſons; and ſaid unto them, Be fruitful and multiply*

and replenish the earth; if, I say, we add to the above observations the consideration of this divine Blessing and injunction, we cannot doubt that the Progeny of *Noah* and his Sons was very much increased soon after the Flood, and sufficiently numerous to re-people the earth.

And, when we farther consider, that after the *Confusion of Babel* (which happened about an hundred years after the deluge) it is said, *Gen.* xi. 9. *And from thence did the Lord scatter them* [*i. e.* the Projectors of *Babel*] *abroad upon the face of the whole earth*; I say, when we consider this, that those who were reluctant to God's design were forced to go, and doubtless many co-operated with the divine intention willingly, and as mankind, within two or three hundred years after the flood, were abundantly sufficient for re-peopling the whole earth, so we may fairly conclude, that within that space of time they actually peopled it.

With regard to the brute part of the world, they certainly complied with the divine injunction, *Gen.* viii. 17. and *were fruitful, multiplied upon the earth, and bred abundantly.* And with respect to their dispersion, their peculiar qualities and instincts would prompt them to seek such countries and climates as would be most suitable to their natures; in the same manner as many of them now pass from one country to another, to immense distances, when the alteration of the season affects them. Add to this, that the mild and meek kind of animals, such especially as were designed to be the prey of others, would naturally avoid the wild and rapacious, and the last would

would as naturally purſue; ſo that both would be induced to get as far from the place where the ark landed, as they conveniently could; and by this means the whole globe would be ſoon re-ſupplied with animals.

THUS then, within two or three hundred years after the Deluge, the whole Earth would be re-peopled with men, and ſtocked with other ani-mals. And as about this time the *Earth* was *divided* or ſplit aſunder, and we may juſtly ſup-poſe that the land, which united *Africa* and *A-merica* together, ſuffered in *this diviſion*, was diſ-joined from the two Continents, and ſunk beneath the Ocean;—ſo would both Continents be ſtill inhabited; though for the time forward the in-habitants of each would be ſeparated from the other.

THUS we have diſcovered an eaſy way by which *America* might have been, and I apprehend, the true way by which it really was ſupplied with inhabitants after the flood; a way this, that af-fords a very convenient paſſage (through a warm and fruitful climate) for the moſt tender and de-licate animals, and ſuch as could not endure any great degree of Cold, and of courſe a very eaſy one for robuſt man.

As a further proof of the *manner* in which I apprehend *America* was firſt peopled, I ſhall here inſert a Letter which I received from the Rev. Mr. *Jones*, on his peruſal of the foregoing ſheet, and alſo an *Extract* from a *Spaniſh writer*, which I did not diſcover 'till the above-mentioned ſheet had been printed off.

The *Rev. Mr.* JONES's Letter.

SIR,

I HAVE lately been favoured with a ſight of ſome printed Pages, containing that part of your work, in which you account for the peopling of the *American* Continent. The point does well deſerve to be examined and cleared up; many writers, of little knowledge and leſs Faith, having made the obſcure ſtate, in which that part of the globe remained for ſo many Ages, an handle for perplexing weak minds with doubts about the authenticity of ſome Articles related in the Holy Scripture.

I WAS much pleaſed to find, that, without knowing it, you are come to the ſame concluſion with myſelf, and, in part, by the ſame premiſes too. As we have both fallen upon the ſame ſcheme, without conſulting one another, it is to be preſumed, that neither of us can be very far from the truth.

THAT the Weſtern Continent did once communicate more nearly with *Europe* and *Africa*, than it does at preſent, I was firſt inclined to believe on reading the following account of *Teneriffe*, one of the *Canary* Iſlands.—That the whole Iſland is deeply impregnated with *Brimſtone*, and is ſuppoſed in former ages to have taken fire, and blown up all at the ſame time.—That many mountains of huge Stones, calcined and burnt, which appear every where about the Iſland, were raiſed and heaved up out of the bowels of the

Earth

Earth at the time of that general conflagration; and that even the *Pico Teneriffe* itſelf was raiſed up by this means to that amazing height at which it is now ſeen. Huge heaps of theſe calcined rocks, or pumice ſtones, are ſpread for three or four miles round the bottom of the *Pico*, in ſuch a manner, as to perſuade any beholder that it muſt have been generated by the ſudden eruption of a Volcano: and even to this day, the mountain ſmoaks and burns perpetually, and there remain the very tracts of the burning rivers of Sulphur, as they ran all over the South-weſtern parts of the Iſland, and deſtroyed the ground paſt recovery. There is a Volcano in another of the Canaries, called the *Palme* Iſland, which raged ſo about twelve years before this account was written, that it cauſed a violent *Earthquake* in *Teneriffe*, though at the diſtance of near twenty leagues, and the people ran out of their houſes, fearing they would have fallen upon their heads.[w]

Now as it appeared to me, from this relation, that the *Pico* was certainly thrown up by the eruption of a *Volcano*[x], and an Earthquake, in all

[w] For theſe particulars, ſee Dr. *Sprat*'s Hiſt. of the *Royal Society*, p. 200.

[x] *This Suppoſition* will not at all invalidate the Account given of the *Formation* of *Mountains* in the ſubſequent part of this Treatiſe; for the *Pico* is no other than a *formleſs Maſs*, or *huge Heap* of *Rubbiſh*, conſiſting of *burnt Stones* and *Cinders*, and was as certainly thrown out by a Volcano as the famous *Monte di Cinere* in the *Lucrine Lake* was, or as thoſe little Iſlands, or rather *Moles*, in the bay of *Sant-Erini* in the *Archipelago* were raiſed by ſubterranean fires and combuſtible Exploſions in the year 1707 [ſee N°. 314 of *Philoſ. Tranſ.*]. As neither of theſe *Eminences* have any thing ſimilar to the *horizontal ſtrata* or *internal Conſtitution* of *Mountains*, ſo they cannot come under the denomination of ſuch, nor ought they to be called *Mountains* or *Iſlands*, as ſome writers have named them.

all probability the moſt violent that ever happened in the world, and ſuch as muſt have made ſtrange havock, the *monument* of this Cataſtrophe being ſo ſingular in its height—a Thought ſuddenly ſtruck me, that in ſome very remote age, a great alteration might have been made in this part of the globe, and a vaſt tract of land ſwallowed up in the Ocean, of which the *Canaries*, *Azores*, and perhaps the great banks of *Newfoundland* alſo, are ſo many remaining fragments, ſtanding like pieces of a wreck above the waves, and ſtill exhibiting to us ſome foot-ſteps, as it were, of the *ancient path* that once led from *Africa* to the *Weſt-Indies*. I was ſo poſſeſſed with this notion, that I could not help propoſing it to ſome learned friends, long before I had heard of *Plato*'s tradition, as a probable conjecture, whereby the peopling of *America* might be accounted for; and endeavoured to recommend it to their conſideration, by placing a terreſtrial Globe before them.

You may imagine then, with what ſatisfaction I found this opinion confirmed even beyond my hopes, when the paſſage you have extracted from *Plato*'s *Timæus* firſt occurred to me. This paſſage is referred to by *Pliny* the natural hiſtorian,[y] and it is hardly to be imagined, that ſuch a curioſity in its kind ſhould eſcape the notice of ſo indefatigable a Compiler; though it was of much leſs value to him then, than to us now. *America* was then unknown; and there was no proſpect,

y *In totum* (*mare* ſcil.) *abſtulit terras, primum omnium ubi Atlanticum mare eſt, ſi Platoni credimus, immenſo ſpatio*. Plin. Nat. Hiſt. Lib. 2. cap. 90.

proſpect, that the tradition, which *Solon* pickt up in *Egypt*, would ever be confirmed as an article of true hiſtory by the diſcovery of a new world. Therefore *Pliny* ſpeaks of it with ſome doubt, inſerting the words—*ſi Platoni credimus:* and ſome of the ancient Commentators on the works of *Plato* did, for the ſame reaſon, convert the whole into an *Allegory*. And ſome excuſe may be made for the Critics who did it in thoſe days, but none at all for thoſe who would do it now; as it muſt appear to any perſon that will conſult the judgment of *Serranus* in this matter, who, in his preface to the *Timæus*, is very ſevere upon theſe unſeaſonable allegorizers, and refutes them copiouſly from the words of *Plato* himſelf. It was very ill-judged in *Acoſta*, therefore, to mention this ſtory from *Plato*, and put it off with the obſolete pretence of its being an allegorical diſcourſe [z]. He hath indeed urged ſome reaſons in defence of what he ſays, but they are too trivial to deſerve any particular conſideration. We are obliged then to underſtand it as an hiſtorical tradition. Thoſe who are inclined to ſlight it, and think the Earthquake *Plato* has deſcribed is incredible, becauſe ſome fabulous circumſtances are blended with the account, ſhould endeavour to ſhew us, what could poſſibly give riſe to ſuch a Report in the eaſtern world: for that *Plato* ſhould ſo expreſly deſcribe an *oppoſite continent* (την καταντικρυ ηπειρον) ſuch as is actually now diſcovered, together with the way that led to it from the Streights of *Gibraltar*, and that this ſtrange report

[z] *Acoſta's Nat. and Moral Hiſt. of the Indies*, p. 72.

report ſhould be grounded on no antient knowledge of the *American* continent, and prove to be true afterwards only by accident—all this would be more incredible than the matter reported, which, if the natural monuments of this great Earthquake, ſtill ſubſiſting, are taken into the account, has all the appearance of truth that can be deſired.

The celebrated *Abbè le Pluſche*, Author of the *Spectacle de la Nature*,[a] tells us, it has been aſſerted by many learned men, that there was formerly a communication between *Africa* and *America*: but he unfortunately ſuppoſes this opinion to have been wholly derived from a miſtake in *Ptolomy*'s antient Chart of the then-known world, which ſtretches out the continent of *Africa* too far to the Weſt; and obſerves withal, that the pretenſion is defeated by what *Herodotus* relates of the voyage that was frequently made from the *Red Sea*, round the *Cape of Good Hope*, to the Pillars of *Hercules*; which could not have been, had the continent of *Africa* been extended to the *Weſt-Indies*. This Objection will not in the leaſt affect any thing you have ſaid upon the Subject: for *Herodotus* is ſpeaking of what was done long after the Diviſion of the continents had taken place; and even before that diviſion, according to the Geography of *Plato*, there was a *gulf*, which afforded a paſſage round the weſtern coaſt of *Africk* to the mouth of the *Mediterranean Sea*.

No reaſonable Objection, therefore, can be made to your Solution of this difficulty. Every candid

[a] Vol. IV. p. 43.

candid Inquirer into Antiquity and Phyſical Knowledge will hold himſelf obliged to you for the curious Obſervations you have thrown in by the way; and the piety of your deſign muſt recommend it to every ſincere friend of Divine Revelation.

Before I conclude, it may not be impertinent to add, that although the more Southerly parts of the continent of *America* were originally peopled, in your way, from the countries that lie near the *Mediterranean*; it is by no means improbable, that the Northern parts may have received inhabitants from ſome other quarters of the Globe.

In a Natural Hiſtory of *Greenland*, written ſo lately as the year 1741, by *Hans Egidius*, a *Daniſh* Miſſionary, we are informed, that it is yet undetermined whether *Greenland* does not join to *America*, on the North-weſt ſide, round *Davis*'s Streights. The Hiſtorian himſelf inclines to the affirmative. He adds moreover, that the *Norwegians*, who diſcovered it in 982, were not the firſt inhabitants; *for that they found wild people on the Weſt-ſide of the country, whom he takes to have been Americans.* Now the Country of *Greenland*, to the South-eaſt, is not ſo far, either from *Iceland*, *Lapland*, or *Norway*, but that various accidents in former ages may have occaſioned ſome communication between them. And thus much for the *North-weſterly* parts of *America*. If we go to the *North-eaſterly* parts, it is ſtill more probable, that ſome colonies may have been tranſplanted thither from *Tartary*. Father *Avril*, a Jeſuit-Miſſionary of *France*, who with ſome others undertook

undertook the diſcovery of a new way by land into *China*, met with a famous Naturaliſt among the *Muſcovites*, who gave him the following account:—" That in the extreme parts of *Tartary*, to the North-eaſt, there is a great River, called *Kawcina*, at the mouth of which is a ſpacious Iſland well peopled. The Inhabitants go frequently, with their wives and families, upon the frozen Sea, to hunt the *Behemoth*, an amphibious animal, whoſe teeth are in great requeſt. It happens many times that, being ſurprized by a ſudden Thaw, they are cut off from all communication with the land, and carried away, nobody knows whither, on huge floating Iſlands of Ice." For my part (added this philoſopher) I am perſuaded, ſeveral of theſe Hunters have been carried to the moſt Northern parts of *America*, which are not far off: and what confirms me in this, the *Americans* of thoſe parts have the ſame countenance and complexion with thoſe unfortunate Iſlanders, whom a violent thirſt after gain expoſes in that manner to be tranſported into a foreign region." [b] The Hiſtorian adds from his own Obſervation, that there are alſo, in that part of *America*, ſeveral of thoſe creatures which are ſo common in *Muſcovy*, and eſpecially *Beavers*, which might have been conveyed by the ſame means. But to determine a matter of ſuch importance, it ſhould be inquired, whether there is any affinity between their languages; for if that ſhould appear, there would remain no farther doubt.

As

[b] *Avril's* Travels, p. 176.

As to the Author you have undertaken to confute, he, it ſeems, would have *America* to have been exempt from that Deluge, by which the reſt of the world was overflowed. This, as you juſtly obſerve, is confuted by a tradition among the *Americans* themſelves concerning the Flood: and it is certainly put out of all diſpute by the natural Evidence afforded by the country itſelf, in which the ſpoils of the Sea are found as plentifully as in other parts of the world. If I remember right, I once communicated to you ſome ſpecimens of Foſſil bodies that came from thence. Since that time, you muſt undoubtedly have enriched your Collection with a great many more from the *Weſt-Indies*.

I am, Sir,

(Heartily wiſhing you all ſucceſs in your laudable Undertaking,)

Your very ſincere Friend,

WADENHO,
June 20, 1761.

And obedient humble Servant,

W. J.

AN EXTRACT FROM

L'Hiſtoire de la Découverte et de la Conquête du PEROU;

Traduite de L'Eſpagnol D'AUGUSTIN DE ZARATE,

Par S. D. C.

A AMSTERDAM; Ann. 1700.

'MANY doubts and objections have been formed concerning the firſt people who ſome ages ſince dwelt in *Peru*, and it has been often aſked, How could they get thither, ſeeing this country is (as it really is) parted by ſuch an extent of ocean from that where the firſt inhabitants of this world lived? It ſeems to me that this difficulty may be ſolv'd by an account given by *Plato* in his *Timæus* or *Dialogue* on *Nature*, and which he ſets down more fully in the following (the *Atlantic*) Dialogue.' There he relates, that " the *Ægyptians* ſaid in honour of the *Athenians*, that, after the defeat of ſome certain kings who came by ſea with a numerous army, they had part of a vaſt iſland called *Atlantique*, juſt beyond the pillars of *Hercules*. That this iſland was larger than all *Aſia* and *Africa* together, and that it was divided into ten kingdoms by *Neptune*, one of which he allotted to each of his ten ſons, beſtowing the largeſt and beſt on his eldeſt ſon *Atlas*." 'To this he adds divers particulars concerning the cuſtoms and the wealth of this iſle, but above all about a ſumptuous temple

temple in the metropolis, the walls of which were entirely decked and covered with gold and ſilver, and the roof covered with copper, with many other particulars too long to enumerate here, and which may be ſeen in the original. It is certain that many of the cuſtoms and ceremonies, mentioned by this author, are yet to be ſeen in the provinces of *Peru.* From this iſle one may paſs to other large iſlands beyond, and which are not far from the firm land, near which is the true ſea.

'BUT hear the words of *Plato* in the beginning of his *Timæus*, where *Socrates* thus harangues the *Athenians*,' "It is looked on as a fact, that in times paſt your city reſiſted a great number of enemies who came from the *Atlantic Sea*, and had taken and poſſeſſed almoſt all *Europe* and *Aſia*; for then this ſtrait was navigable, and near it was an iſland juſt beyond the pillars of *Hercules*, which they ſaid was larger than *Aſia* and *Africa* put together. From this iſland was an eaſy paſſage to others that were near it, and oppoſite the Continent, or the main land bordering on the true ſea; for one may juſtly call that ſea *the true ſea* or *ocean*, and the land I mentioned the *Continent* or *main Land*." 'Juſt below *Plato* adds,' "Nine thouſand years ago happened a great change, the ſea ſurrounding this iſle ſwelled ſo high by a prodigious increaſe of water, that in one day and night it covered the whole iſland, and ſwallowed and totally engulphed it; and that the ſea in this place has been ever ſince ſo filled with mud and ſands, that no one can ſail over it,

or paſs by it to thoſe other iſlands on the firm land."

'SOME deem this relation an allegory, as *Marſilius Ficinus* tells us in his notes on *Timæus*. Nevertheleſs moſt commentators on *Plato*, even *Platinus* and *Ficinus* himſelf look on this account not as a fiction but an *hiſtorical Truth*. Beſides; one can by no means think that the nine thouſand years which he mentions is a proof of its being a fable, becauſe, according to *Eudoxus*, one muſt count them after the *Ægyptian* manner, not as *ſolar* but as *lunar years*, that is to ſay, nine thouſand months, anſwering to ſeven hundred and fifty years. On this ſubject one may obſerve, that all hiſtorians and coſmographers, antient and modern, call *that Sea*, in which this iſland was engulphed, *the* ATLANTIC OCEAN, retaining even the *very Name* the iſland bore; which ſeems a ſufficient proof that there had been ſuch an iſland.

'ADMITTING then the truth of this hiſtory, no one can deny this iſland (beginning near the ſtraits of *Gibraltar)* to have been of that extent, from the north ſouthward and from the eaſt weſtward, as to be more than as large as *Aſia* and *Africa*. By the other *neighbouring* iſlands are doubtleſs meant *Hiſpaniola*, *Cuba*, *Jamaica*, *St. Johns*, and thoſe on the Coaſt. By the *Continent* or *Firm-land*, (oppoſite to thoſe iſles) mentioned by *Plato*, is certainly meant *That land* which is even *to this day* called *Terra Firma*, with the other provinces, which from *Magellan* northward compriſe *Peru*, *Popayan*, *Cas-del-oro*, *Paraguay*,

Paraguay, *Nicaragua*, *Guatimala*, *New-Spain*, *Seven-towns*, *Florida*, the *Bacallaos*, and north up to *Norway*. Without doubt this vaſt tract of land is larger than the three quarters of the then known world. And one muſt not be ſurprized at this new world's not having been diſcovered by the *Romans*, or any of thoſe other nations that at different times abode in *Spain*; becauſe one may reaſonably imagine that the 'fore-mentioned ſuppoſed difficulty of navigating this ſea then remained. This indeed I have heard ſaid, and can ſee no difficulty in believing that this ſhould eaſily prevent the diſcovery of this new world mentioned by *Plato*. The authority of this philoſopher is enough to convince me of the truth of this affair, and I make no queſtion but our *new-found world* is the ſame as that main *Land* or *Continent* of which he ſpeaks; as whatever he has ſaid of it perfectly correſponds with our modern Diſcoveries; particularly in what he ſays of this land, that it is adjacent to the *true ſea*, which is what we now call the *Great South Sea*; in compariſon of the vaſt extent of which, the *Mediterranean Sea* and *Northern Ocean* are but as rivers. Having cleared up this difficulty thus far, it ſeems no way hard to ſuppoſe, that men could eaſily paſs from the *Atlantic* and its *neighbouring Iſles* to what we call the *Continent* or *Terra Firma*, and thence by land, or even by the *South Sea*, to *Peru*.

'THUS I have declared what ſeems to me moſt probable on a ſubject ſo perplexed, on account of its antiquity, and alſo becauſe one can

get no intelligence from the inhabitants of *Peru*; who know not the uſe of letters or writing to preſerve the memory of things paſt. In *New Spain* indeed they have certain pictures which ſerve them for letters and books; but in *Peru* they have nothing but knotted ſtrings of various colours: it is true, by means of theſe knots, and the diſtance they are ſet at from each other, they comprehend (though but confuſedly) any thing, as I ſhall ſhew at large in this hiſtory of *Peru*. In regard to the diſcovery of theſe vaſt tracts of land, what *Seneca* ſays, as it were in a prophetical ſenſe, in his *Medea*, ſeems to me to be not unapplicable,

" *Venient annis Sæcula ſeris,*
Quibus Oceanus vincula rerum
Laxet, novoſque Tiphys detegat orbes,
Atque ingens pateat tellus,
Nec ſit terris ultima Thule."

" In lateſt times our hardy ſons ſhall brave
Stern Ocean's rage, and ſtem the diſtant wave,
In them reviv'd ſhall *Tiphys* wond'ring ſee
The new-found world, emerging from the ſea;
No more ſhall *Thule* be the utmoſt bound,
But earth from pole to pole be ſearched round."

NATURAL

NATURAL PROOFS

OF THE

SCRIPTURE-ACCOUNT

OF THE

DELUGE,

Deduced from a great Variety of Circumſtances, on and in the Terraqueous Globe.

PART III.

I AM now come to lay before the reader what natural proofs may be deduced from the preſent ſituation of things in the earth, in favour of the *Moſaic* deſcription of the Deluge.

AND here, I ſhall ſelect *four Particulars*, which if I can evince, the truth of the whole will, I believe, be readily admitted, *viz.* if I can prove—

 I. *That*

I. *That there is a quantity of water in the earth abundantly ſufficient for flooding it to the height repreſented in Scripture;*

II. *That this water did actually thus overflow it;*

III. *That, during this Flood, the ſolid ſtructure or compages of the earth was diſſolved, all the mineral and metallic matter reduced to its original corpuſcles, and aſſumed up into the water; ſo that the whole conſtituted one fluid maſs or colluvies;*

IV. *That all this matter, together with the animal and vegetable bodies incloſed within it, ſubſided again, and formed the preſent ſolid ſtrata of the earth.*

If, I ſay, I can prove theſe *four points*, the truth of the *Moſaic* deſcription of the Flood cannot, I think, well be diſputed.

And I. to ſhew, *That there is a ſufficient quantity of water in the earth for covering all the high mountains under the whole heaven*, or rather the *whole ſurface* of the Earth above the height of the higheſt mountains.

This has been thought the main and principal hinge on which the whole affair of the Deluge turns, the *Cauſa ſine quâ non* of ſolving that grand cataſtrophe; for unleſs we can procure ſufficient materials for the work, it would be idle to attempt the ſolution of the effect. And all nature, both from above and from below, has been ranſacked by ſeveral writers on this ſubject to find out

out a place where there lies a quantity of water ſufficient for flooding the earth; which, conſidering the light that writers in general have looked upon the deluge in, namely as a flood of waters *barely overflowing* the terreſtrial parts of the globe, is a matter of ſome ſurprize that they ſhould be at a loſs to find a ſuitable quantity: for let any one but caſt his eye over a map or globe of the earth, and he will at once perceive that the Ocean and Seas greatly exceed the terreſtrial parts, and if he will take a nearer and more accurate ſurvey, and add to the account the ſpaces occupied by all the rivers and lakes upon the earth, he will find, that the *dry land* comprehends not more than, if ſo much as, one *third part* of the earth's ſurface. And as it is well known, that the ſea is unfathomable in many places, and that its depth is equal to the height of the mountains;[c] ſo it is evident, and manifeſt to

[c] See VARENIUS's *Geography*, by SHAW, Vol. I. p. 123, 195—8. As I ſhall have occaſion to quote this Treatiſe hereafter, it may not be amiſs to acquaint the reader with its authority and character. Sir *Iſaac Newton* thought it ſo judicious and uſeful a work, that he reprinted an accurate *Latin* edition of it at *Cambridge*, for the uſe of the Students in that Univerſity. This edition meeting with a quick ſale, and conſequently ſoon becoming ſcarce, Dr. *Bentley* importuned Dr. *Jurin* to print another edition, and to affix an appendix of later Diſcoveries. Mr. *Dugdale* publiſhed an *Engliſh Tranſlation* from *Jurin*'s edition, with ſeveral additional notes; which has ſince been reviſed, corrected, and re-publiſhed by Dr. *Shaw*. And I ſcarce know a more uſeful Book for a Student in Philoſophy to begin with.

See alſo *Hiſtoire Phyſique de la Mer par Comte de* MARSILLI, p. 11. This alſo is a valuable Treatiſe, and the Author of it ſo well known for his indefatigable induſtry, judgment, and accuracy in making experiments and obſervations upon the tops of the higheſt mountains, the deepeſt caves, and even the bottom of the Sea, that I need only to mention his name to gain credit to his book.

to ſenſe, that there is a quantity of water in the earth capable of covering all the high mountains under the whole heaven. But as this act of *barely covering* the mountains will not anſwer the deſcription of the Flood as given in Scripture, nor ſuit with the *effects* of that Flood as they are now diſcernible upon and in the earth (of which hereafter) ſo we muſt find out a quantity even greater than this. But what I have ſaid may ſerve to pave the way, and leſſen the wonder the reader may conceive concerning the quantity of water requiſite for ſuch a grand tranſaction.

The Prelude to which mighty event was, according to *Moſes*, *The breaking up of the fountains of the Great Deep*. What this *Great Deep* or *Abyſs* is, has been ſhewn already, namely, that it is an immenſely large Reſervoir of water lying beneath the circular ſhell of the earth, communicating with all leſſer Deeps or Seas, and affording ſupplies for the numerous rivers upon the earth. Such is the Scriptural account of this Abyſs, ſee p. 43, *&c.*

Let us now ſee what reaſon there is to believe, from a view of the ſtructure and parts of this globe, that there is ſuch a ſubterraneous magazine of water.

1. The *firſt* argument which I ſhall bring in proof of this Abyſs is (to ſpeak in the words of *Scripture* wherever we can) *That all the rivers run into the Sea, and yet the Sea is not full*, or does not reach the height of or run over its ſhores. This is a fact as ſurpriſing as it is apparent; but, like other common truths, the obviouſneſs of it

leſſens

leſſens the wonder, and takes off the weighty conſiderations deducible therefrom. But the Event in itſelf is truly wonderful, and deſerves our particular notice on the preſent occaſion.

To enumerate and deſcribe all the rivers upon the earth would be endleſs and impoſſible. I ſhall therefore mention ſome of the largeſt; in order that we may form a judgment of the quantity of water poured into the Sea by all of them.

The *Danube*, after it has ran a courſe of above *two thouſand miles*, and received by the way ſixty rivers, (thirty of which are ſo large as to be navigable) throws itſelf, by five or ſix great ſtreams, with ſuch rapidity, into the *Euxine* Sea, that its water continues freſh and unmixt with the ſalt for *twenty leagues*. Its depth, in moſt places, is *two hundred feet*. [Collier's *Hiſtorical, Geographical, &c. Dictionary*.]

The *Volga*, after it has taken an irregular tour of *two thouſand nine hundred miles*, and increaſed its ſtream by the addition of two hundred rivers and brooks, diſcharges itſelf by *twenty-five mouths* into the *Caſpian* Sea, and makes that Sea leſs brackiſh for *many leagues*. [*Atlas Geographus*, Vol. I. p. 164. Varenius, p. 291.]

The *Oby*, a river in *Siberia*, in ſome places half a league, and in others a whole league *broad*, runs for about *two thouſand four hundred miles* (without reckoning its windings) and then empties itſelf by *ſix mouths* into the *Icy* Sea. [*Atlas Geog.* p. 165. Varenius's *Geography*, Vol. I. p. 349.]

To which we may add the *Jeniſa*, about ten weeks

weeks journey diſtant from the former river, and equal, if not ſuperior to it, both in *length* and *breadth*.

THE *Croccæus*, or *yellow river* of *China*, after having flowed through ſeveral Provinces for more than *two thouſand miles*, falls at length into the Eaſt-Sea. [LE COMTE's *Obſervations made in a Journey through the Empire of* China, p. 108.] Not far from this is the *Kiam*, remarkable for its *depth*, being unfathomable in ſeveral places, ſo that the *Chineſe* have a proverb among them which ſays, *The Sea hath no bounds, and the* Kiam *hath no bottom*. This impetuous river (which is ſo very rapid when the torrents from the mountains increaſe its ſtream, that it frequently bears away the iſlands that lye in its channel, and buries them under its waves) after having ran a courſe of *twelve hundred miles*, diſburthens itſelf into the Eaſt-Sea of *China*.

THE *Ganges*, famous for its length, breadth, and depth, being near *fifteen hundred miles* long; and in its narroweſt places *eight miles* broad, in the moſt open parts *twenty*; and ſeldom ſo ſhallow but that its depth meaſures an *hundred feet*. [SALMON's *modern Gazetteer*; HEYLYN's *Coſmography*, p. 879.]

THE *Euphrates*, after having ran a courſe of about a *thouſand miles*, joins that remarkably rapid river the *Tigris* (after the *Tigris* had paſſed a courſe of about *five hundred miles*) and both of them, about *ſixty miles* beyond their union, exonerate themſelves into the *Perſian* Gulph.

THE *Nile* takes its riſe in 12 deg. of N. Lat. and

and having flowed *fifteen hundred miles*, nearly from South to North, divides into two branches, and then falls into the *Mediterranean* Sea. [SALMON'S *preſent ſtate of all nations*, Vol. V. p. 10.]

THE *Niger*, the longeſt river in *Africa*, after a courſe of *two thouſand four hundred miles*, empties itſelf by ſix great ſtreams into the *Atlantic* Ocean. [VARENIUS, p. 349. COLLIER'S *Dict.*]

THE *Zaire*, another river in *Africa*, which, though it does not equal any of the above in the length of its courſe, yet exceeds them all in its breadth, being at its mouth *twenty-eight miles* broad, and ruſhes into the *Ethiopic* Sea with ſo great a force, as to preſerve its waters pure and freſh for *ten miles* commonly, for *fifteen* at other times. [HEYLYN'S *Coſmog.* p. 989, 995.]

BUT if we paſs into *America*, we ſhall find rivers exceeding any yet mentioned. The river of St. *Laurence*, after having ran through and been fed by ſeveral great Lakes, and taken a courſe of *one thouſand five hundred miles* (and its ſource yet unknown) diſcharges itſelf into the gulph of St. *Laurence*; being at its mouth between *ſeventy* and *eighty miles* broad, and *two hundred fathoms deep*. [COLLIER'S *Dict.*]

THE *Paria* or *Oronoque* is navigable for a *thouſand miles* by ſhips of burden, and *two thouſand* by boats and pinnaces; and, having received into its channel an *hundred rivers*, openeth into the ſea with *ſixteen mouths*, which part the earth into ſo many iſlands. [HEYLYN'S *Coſmography*, p. 1056.]

Rio de la Plata, in length from its firſt fountain *two thouſand miles*, in breadth at its fall into the

the Sea *ſixty miles*, and of ſo violent a ſtream, that the Sea, for *many leagues* together, altereth not the taſte of it. [Ibid.]

THE River of the *Amazons*, eſteemed the greateſt in the world; *Orellana* is reported to have ſailed in it *five thouſand miles*, including the ſeveral turnings and windings he took; in many places it is ſo deep as to be unfathomable; and, at the time of its higheſt riſings, the Current is *an hundred and eighty miles* broad, and ruſhes into the Sea with ſuch impetuoſity as to preſerve its natural taſte and colour for more than *thirty miles*. [Ibid. COOKE's *Voyage to the South Sea, &c.* p. 254.]

Now to the above let any one make an addition of all the remaining rivers upon the earth, and then conceive within himſelf what an immenſe profuſion of water muſt be poured into the Ocean, I need not ſay, *yearly*, *monthly*, but *daily*, or even *hourly*. —It was the opinion of that accurate Geographer *Varenius*,[d] [and to which, I believe, every one upon mature conſideration will conſent, as Bp. *Stillingfleet*, Dr. *Plot*, *Stackhouſe*, and others have done] that *each* of the larger ſort of rivers (and ſuch, every one of thoſe that I have mentioned above, may well be eſteemed, and many others that are not mentioned) empties into the Sea, in one year's time, a *quantity of water ſufficient* to *cover the whole ſurface* of the earth. And if *ſeveral* rivers, *ſingly* conſidered, throw in *ſuch a quantity*, and *ſome* of them a *far*

[d] *Gen. Geography*, p. 299.

far greater, what muſt *all* of them added together effund?

In order to ſee what a quantity this would amount to, and to what a height, if it was poured upon the earth, it would ariſe, let us ſuppoſe, that the *mouths* of all the rivers, or the places where they enter into the Sea, were ſtopped and dammed up ſo high, that their currents were diverted from ruſhing into the ſea, and turned back upon the dry-land; and how ſoon would the higheſt mountains be covered?—For, if one river, in one year's time, produces a quantity ſufficient to effect this, (or rather twice as much as would be ſufficient, for the *dry land* occupies but one *third part* of the earth's ſurface) and there are many ſuch rivers, and ſeveral much larger, and if all the leſſer ſtreams were united, they would exceed the larger already mentioned, How ſoon, I ſay, in this caſe, muſt the higheſt mountains be covered? Surely, not many *days*, if *hours*, would be requiſite for ſuch an inundation.

Now when we conſider, that ſuch an inconceivably great quantity of water is *daily*, or at leaſt *weekly*, diſcharged into the Sea, and yet *the Sea is not full*, nor even any viſible increaſe produced thereby, What an immenſely large receptacle muſt there be beneath the Ocean and the Land for containing ſuch an aſſemblage of water? Well might it be called in Scripture THE GREAT DEEP, as all leſſer Deeps or Seas are nothing in compariſon to it.

Allowance indeed muſt be made in the

above

above calculation, for *the quantity of water that is raiſed from the Ocean in vapour by the heat of the ſun*, &c. which ſome have been ſo extravagant as to imagine to be equal to That which is poured into the Ocean by all the rivers upon earth; and therefore they ſuppoſe, *that what the Sea gets by the rivers it loſes by evaporation*; and ſo a mutual and equable interchange is preſerved.

But ſurely this Hypotheſis can never ſtand the examination of common ſenſe or experiments.

For *1ſt*. It is well known, that the vapours and rain fall upon the Sea, as well as upon the land; and the *ſurface of the Ocean* is full as *large again* as That of the dry land; ſo we may juſtly ſuppoſe that two thirds of what is raiſed in vapour returns from whence it came, without falling upon the dry land.

2dly. Beſides, as, it has been obſerved "This is a *Summer reaſon*, and would paſs very ill in winter, eſpecially in our Northern climate, when the heat of the Sun is much leſs powerful;" and yet our Seas have no ſuch ſenſible diminution in Summer, or overflux in winter, as might be expected, if their increaſe and decreaſe depended ſo much upon *vapours*. And,

3*dly*, I may add too, This is a *day reaſon*, and will not hold in the night; when the vapours frequently fall nearly as faſt as they roſe in the precedent day.

But, 4*thly*, Since the favourers of this hypotheſis ſuppoſe, *That the ſupply of all the rivers upon earth is owing to the vapours that are raiſed from the Sea, carried from thence by wind, and condenſed*

condenſed againſt the ſides of mountains, and ſo trickling down through the crannies of the rocks, enter into the hollow places thereof, form collections of water, &c. *from whence they iſſue out at the firſt orifice they can find, and by this means conſtitute* SPRINGS *and* RIVERS; ſince, I ſay, they hold this hypotheſis as a *conſequence* of the former, it ſhould follow, *That as the evaporations are greater in Summer time than in Winter, ſo the Springs and Rivers (which depend upon the quantity of theſe evaporations) ought to be higher and fuller in Summer than in Winter*; the contrary to which is well known to be fact, at leaſt in our Northern regions; unleſs when the vapours happen to be congealed and frozen into Snow, as ſoon as they fall; and then they of courſe (in their *frozen* and *confined* ſtate) cannot afford any ſupply for the augmentation of rivers; and in this caſe, or in ſuch places where this happens, the rivers generally remain of the *ſame height* in *Winter* as in *Summer*. Which laſt conſideration will furniſh another argument againſt the opinion of thoſe who aſcribe the origin of Springs and Rivers to the condenſation of vapours againſt the ſides of mountains, *&c.* for it is obſerved by Mr. *Ray*, (who himſelf travelled over the *Alps*) "That the tops of the *Alps* above the fountains of four of the greateſt rivers in *Europe*, the *Rhine*, the *Rhoſne*, the *Danube*, and the *Po*, are for about *ſix months* in the year *conſtantly covered with Snow* to a *great thickneſs*; ſo that there are *no vapours* all that while that can touch thoſe mountains, and be by them condenſed into water: there falls

nothing

nothing there but Snow; and that, continuing all that while on the ground *without diſſolution*, hinders all acceſs of vapours to the earth, if any roſe, or were by winds carried ſo high in that form, as I am confident there are not. And yet for all that *do not* thoſe *Springs fail*, but continue to *run all winter*, and it is likely too, *without diminution*."

But, Laſtly, this Hypotheſis—*that the origin of Springs and Rivers is owing to vapours condenſed into water and rain, and that the quantity of water which is evaporated from the Ocean is equal to that which is poured into it by all the rivers upon the earth*—has been ſo fully examined and confuted by Dr. *Gualtieri* in anſwer to Dr. *Valiſnieri* (who maintained the above hypotheſis) and this too, by making the moſt reaſonable, or rather over-reaſonable allowances to the favourers of this hypotheſis, that I ſhall only tranſcribe part of what Dr. *Gualtieri* has ſaid on this head, as it is *abridged* in the *Memoirs of Literature* for *Aug.* 1725. "After this, Dr. *Gualtieri* undertakes to prove *the impoſſibility of aſcribing the origin of Springs and Rivers to rain-water*, &c.—To demonſtrate this impoſſibility, it ought to be proved, that *the quantity of rain-water is far from being ſufficient to keep up the continual courſe of ſprings and rivers.* And to ſet that propoſition in its full light, one muſt determine by a calculation the quantity of rain-water, and the quantity of the water of thoſe rivers that fall into the ſea; and if one exceeds the other conſiderably, the queſtion will be decided.

"It

It results (says the Author) from the observations made by the *Paris* Academy, for the space of *nineteen years*, that the mean quantity of rain, that falls at *Paris*, is about eighteen or nineteen inches high every year.[e] To find how much it rains in *Italy* during one year, the Author requires, that the whole surface of that country be reduced to an oblong rectangular parallelogram; the length whereof be of six hundred miles of *Bologna*, and the breadth of one hundred and twenty. In the next place, he supposes that all the water falling upon that extent of ground, in the space of one year, is kept in, without being able to run out; that water, in this supposition, will rise, according to the observations of the Academy, to the height of *one foot and a half*; and if the whole be calculated, it will appear to amount to the sum of *two trillions, seven hundred billions of cube feet of water*, that fall in one year upon the surface of all *Italy*. Now, in order to know the quantity of water carried into the sea by all the rivers of that country in one

 year,

[e] It may be proper to make a few remarks here, 1st. That it has been now determined by a course of observations that have been successively continued by the Professors of the Academy for no less than *fifty-five years*, that at a medium, or one year with another, there falls no more than *sixteen inches and eight lines* of *rain*; see Templeman's *Extracts from the Memoirs of the Academy at Paris*, Vol. II. p. 327; just printed. 2dly. That under the term *Rain* is also included all the water that falls in *snow*, *dew*, *vapours*, &c. 3dly. That this quantity is measured almost as soon as it falls, and the sum total determined from these several lesser measurements; and no allowance made for what would otherwise have been carried off by *winds*, by *exhalations*, consumed in *vegetation*, *imbibed by the earth*, &c. which, if taken into the account, would greatly lessen the above estimate.

year, we muſt ſuppoſe a canal of a depth and breadth proportionable to the dimenſions of thoſe rivers, whereof thoſe that fall into the ſea are *two hundred* in number, without reckoning the other rivers, brooks, fountains, ſubterraneous canals, *&c.* Dr. *Gualtieri*, before he determines the length and breadth of ſuch a canal, obſerves that the *Po* is near a *mile broad* at its entrance into the ſea. If we add to the waters of the *Po* thoſe of *eighteen* other *great rivers*, can we allow to a canal that ſhould contain them all leſs than *one mile* or *five thouſand* feet in breadth, and *twenty* feet in depth? If we add ſtill the water of the ſmall rivers, and of all the fountains and ſprings that fall into the ſea, can any one believe that thoſe waters collected can be contained in ſuch a canal? [Doubtleſs not.]"

" HOWEVER, the Author is willing to reduce the breadth of that canal to that of one thouſand two hundred and fifty feet, which is only the *fourth* part of five thouſand, and its depth to that of fifteen feet." [This certainly is an over-reaſonable *allowance* given to his adverſary.] " After this reduction, the author, following the calculation of Dr. *Guglielmini*, finds that the quantity of water continually carried into the ſea by a canal of that dimenſion, during three hundred and ſixty-ſix days, would be equal to the ſum of *five trillions, five hundred twenty-two billions, three hundred ninety-one millions of cube feet of water.* But all the rain-water, that falls in *Italy* during one year, amounts only to the quantity of *two trillions, ſeven hundred billions of cube feet of water.*

Therefore

Therefore all the rivers in *Italy* carry into the ſea *two trillions, eight hundred twenty-two billions, three hundred ninety-one millions of cube feet of water* ABOVE that which the rain affords in one year. From whence comes that overplus, if it be not from the ſea itſelf [or rather from the Abyſs that lieth within the earth]?"

" THE Author confirms this proof by another ſort of ſupputation, *viz.* by that of the *quantity of water which evaporates daily.* 'Tis well known, (ſays he) by ſeveral experiments, that from a ſurface of water ten inches ſquare a cube inch of water evaporates in twenty-four hours. A ſquare mile of water contains twenty-five millions of ſquare feet of water, which make three billions, ſix hundred millions of ſquare inches: from whence it follows, that from a ſurface of a ſquare mile three hundred ſixty millions of cube inches of water evaporate in twenty-fours, which make two hundred and eight thouſand, three hundred thirty-three cube feet. Allowing the *Mediterranean* Sea to be three thouſand miles long and four hundred and twenty miles broad, its whole ſurface will be of one million, two hundred and ſixty thouſand ſquare miles, which number being multiplied by that of two hundred and eight thouſand, three hundred thirty-three cube feet, we ſhall have the number of two hundred and ſixty-two billions, four hundred and ninety-nine millions, five hundred and eighty thouſand cube feet of water, which in twenty-four hours evaporate from the whole ſurface of the *Mediterranean* ſea; and multiplying again that number by that of three hundred and ſixty-five days, there will be *ninety-five tril-*

lions, eight hundred and twelve billions, three hundred and forty-ſix millions, ſeven hundred thouſand cube feet of water, which evaporate from the ſame ſurface in the ſpace of *one year*. Afterwards if we reduce all the rivers that fall into the *Mediterranean* to a canal ſix *Italian* miles broad, and fifteen feet deep (which is a very low ſuppoſition) ſuch a canal will carry into that ſea *a hundred thirty-two trillions, five hundred thirty-ſeven billions, three hundred eighty-four millions of cube feet of water*—a quantity very much exceeding that which evaporates from that ſea in one year.

" THAT Dr. *Valiſnieri* may have no ground to complain, the Author is willing to grant him, againſt the teſtimony of all obſervations, that *thirty inches* of water fall in *Italy* every year. But he tells him at the ſame time, that all this water is not employed in keeping up the courſe of fountains and rivers. One muſt deduct out of it, 1. All the quantity neceſſary to moiſten the ground to the depth of ſome fathoms, without which an exceſſive drought would reduce it to duſt; and this quantity muſt needs be very conſiderable. 2. One muſt deduct that quantity which ſerves for the nouriſhment and growth of trees, and all the other plants of *Italy*, during the whole year; and in order to conceive how far this can go, it is ſufficient to conſider that, according to the experiments of Mr. *de la Hire*, one ſingle fig-tree, furniſhed with an hundred and thirty leaves, abſorbs *two pounds* and a *half* of water, in the ſpace of *five hours*, and conſequently *three thouſand one hundred*

hundred and ninety four pounds in one year. 3. One muſt deduct out of rain-water that which *continually evaporates*, the quantity whereof has been determined above. Now, how likely is it that thirty inches of water yearly may be ſufficient for all thoſe uſes, and that there ſhould remain enough ſtill to keep up the *courſe of fountains and rivers?*

" AGAIN; Dr. *Gualtieri* makes another impoſſible ſuppoſition in favour of his adverſary, *viz.* that out of thoſe thirty inches of water fifteen only are employed for the *continual evaporation*, and to *ſupply the wants of the ground and plants*; and that the other fifteen inches ſerve for the courſe of fountains and rivers. But notwithſtanding all the endeavours of Dr. *Gualtieri* in favour of his antagoniſt, what ſhift can the latter make with fifteen inches of water, whilſt the eighteen inches found by the Academy are, as has been ſhewn above, *much beneath* the quantity requiſite to keep up that *perpetual commerce* between freſh and ſea-water?"

II. SECONDLY, As the quantity of water that is poured into the Ocean from the *mouths* of all the rivers upon the earth proves the *certainty of an Abyſs beneath the Ocean and the Land*, ſo the quantity that is thrown out at the *heads* or ſources of all the rivers equally proves *the ſame*, and eſpecially that *this Abyſs lyeth beneath the Earth* as well as the ſea.

IN the above deſcription of ſeveral of the larger rivers, I have mentioned the *length of their courſes* as well as *breadth of their mouths*, in order that

the reader may judge from thence what an immenſe quantity of water is requiſite for preſerving their channels full, and keeping their currents ſtrong; and alſo that he may obſerve, that their Sources, or the Springs that ſupply them with water, lye high up in the inland countries, ſo that ſeveral of them are ſome *hundred*, nay *thouſands of miles* diſtant from the Sea they at laſt fall into; and ſome of their Springs riſe in the very middle or center of the largeſt Continents. So that ſince they are ſituated at ſuch a vaſt diſtance from any ſea, and take their riſe generally in the higheſt mountains, the *reſervoir* that ſupplies them with water muſt certainly be *beneath thoſe mountains.*

And ſince, beſides theſe larger rivers, there are a multitude of other rivers, rivulets, and ſprings, that indiſcriminately ariſe in and paſs through the different parts of any one of the larger Continents into which the world is uſually divided; ſo that if a perſon would but take a view of the map of either of the Continents, and obſerve the heads of the ſeveral rivers that ſpring up in it, that Continent, and ſo the whole Earth, would appear as if it were bored through in innumerable places, through which a continual efflux of water proceeded; and from hence he will readily conclude, that *the Earth is*, as the *Pſalmiſt* ſays, *ſtretched out* or *expanded upon water*, or *eſtabliſhed upon the Abyſs that lieth beneath*; ſee p. 43, *&c.*

To ſay, that the *Origin* of theſe ſprings and rivers is owing to *rain* and *vapours condenſed* againſt the ſides of mountains, is, as we have already

ſeen,

ſeen, falſe in fact as well as anti-ſcriptural. But as it is the preſent prevailing opinion, it may be expected that I ſhould examine the chief of the arguments uſually brought in favour of it; which I ſhall do, and endeavour to confute them; and then introduce an experiment or two, which ought for ever to ſilence this opinion, and which indeed might make thoſe aſhamed of it that have embraced it.

The *firſt* and *chief* argument—*that the quantity of water which falls in rain and vapours throughout the year is ſufficient for the ſupply of all the rivers upon the earth*—has been already ſhewn to be an egregious miſtake; there being no reaſon to think it ſufficient for the ſupply of *one* of the *larger rivers*, much leſs for *all*, during that ſpace of time.

Secondly, It has been ſaid, *That ſince rivers increaſe and overflow their banks after any great rains, eſpecially ſuch as are periodical, and after the flowing or melting of the ſnow upon the mountains, it certainly follows, that their ſupplies are owing to rain, vapours, or ſnow.*—But this is ſo far from proving that the *conſtant* and *regular flux* of *rivers* and of *perennial ſprings* (which is the point in queſtion) is derived from hence, that it rather proves the contrary; and only ſhews that the *ſudden increaſe* or *accidental inundations* of ſuch rivers and ſprings may be owing to theſe cauſes; but does not at all account for the water that continually iſſues forth from the ſprings or heads of rivers, and which affords them a *conſtant* and

equable ſupply, when no ſuch rains fall, and no ſnow is melted.

THE obſervations of the ingenious Dr. *Derham*, in his *Phyſico-Theology* (Book II. chap. v.) on this head, are well worth reciting; " That ſprings have their origin from the ſea [or *ſubterranean waters*, in the ſenſe Dr. *Plot* underſtands it, in his *Tentamen Philoſ. de origine Fontium*, §. 51. as Dr. *Derham* refers to that book for a farther diſcuſſion of the ſubject] and not from rain and vapours, among many other ſtrong reaſons, I conclude from the perennity of divers ſprings, which always afford the ſame quantity of water. Of this ſort there are many to be found every where, [as may be ſeen in the above mentioned Treatiſe of Dr. *Plot*.] But I ſhall, for an inſtance, ſingle out one in the pariſh of *Upminſter*, where I live, as being very proper for my purpoſe, and one that I have had better opportunities of making remarks upon *above twenty years*. This in the greateſt droughts is little, if at all diminiſhed, that I could perceive by my eye, although the ponds all over the country, and an adjoining brook, have been dry for *many months* together; as particularly in the dry Summer months of the year 1705. And in the wetteſt ſeaſons, ſuch as the Summer and other months were preceding the violent ſtorm in *November*, 1703. (vid. *Philoſ. Tranſ.* N° 289.) I ſay, in ſuch wet ſeaſons I have not obſerved any increment of its ſtream, excepting only for violent rains falling therein, or running down from the higher lands into it, which diſcoloureth the waters oftentimes, and makes an increaſe of only a day's,

day's, or ſometimes but a few hours continuance. But now, if this ſpring had its origin from rain and vapours, there would be an increaſe and decreaſe of the one, as there ſhould happen to be of the other: as actually it is in *ſuch temporary* [f] ſprings, as have undoubtedly their ſource from rain and vapours.

" But beſides this, another conſiderable thing in this *Upminſter* ſpring (and thouſands of others) is, that it breaks out of ſo inconſiderable an hillock or eminence of ground, that can have no more influence in the condenſation of the vapours or ſtopping the clouds (which the Maintainers of this hypotheſis ſuppoſe) than the lower lands about it have. By ſome critical obſervations I made with a very nice portable barometer, my houſe ſtands between eighty and ninety feet higher than the low-water mark in the river of *Thames*, neareſt me, and that part of the river being ſcarce thirty miles from the ſea, I gueſs (and am more confirmed from ſome later experiments) that we cannot be much above an hundred feet above the ſea. The ſpring, I judge, is nearly level with or but little higher than where my houſe ſtands; and the lands from whence it immediately iſſued, I gueſs, about fifteen or twenty feet higher than the ſpring, and the lands above that of no very remarkable

[f] Of this kind was the *Spring* or *Water* that ſupplied the Brook *Cherith*, mentioned 1 *Kings* xvii. 7. which at the *beginning* of a *great drought* (conſequent of a prophecy of *Elijah*, that *there ſhould be neither dew nor rain for ſome years*) was dried up; *And it came to paſs after a while, that the Brook dried up, becauſe there had been no rain in the land.* But all this time there were *other Springs* and *Fountains*, as appears from what is ſaid, 1 *Kings* xviii. 5.

markable height. And indeed, by actual measure, one of the higheſt hills I have met with in *Eſſex* is but three hundred and ſixty-three feet high, (vid. *Phil. Tranſ.* N° 313. p. 16.) and I gueſs, by ſome very late experiments I made, neither that, nor any other land in *Eſſex*, to be above four hundred feet above the ſea. Now what is ſo inconſiderable a riſe of land to a perennial condenſation of vapours, fit to maintain even ſo inconſiderable a fountain as what I have mentioned is, or indeed the high-lands of the whole large county of *Eſſex* to the maintaining *all its fountains* and *rivulets?*"

AGAIN; it has been ſaid, *That the rain that falls, and the ſnow that is melted, upon the mountains, ſink through the earth, and are reſerved there in large cavities or baſons, from whence they are gradually diſpenſed for the ſupply of ſprings and rivers.* —But the above argument deſtroys this, for we find that rivers ſwell and increaſe *immediately after* and *in proportion* to the rain that falls or the ſnow that is melted; and therefore, the water that proceeds from either is not detained within the mountains. And it is evident to ſenſe that, after any ſudden ſhower, or even a rain of long continuance, or the gradual melting of ſnow, the water which proceeds from either flows down from the mountains along upon the ſurface, almoſt as ſoon as it falls, and does not enter into the bowels of the earth [unleſs where there happen to be natural hollows or pits dug for mining, *&c.* which *lie open to the ſurface*; and then *ſome part* of the rain that falls will of courſe paſs thro' theſe;

theſe; but as this tinges the water of the ſpring with the colour of the ſoil it has paſſed through, ſo its continuance is eaſily diſtinguiſhable, and it ſeldom laſts above a few hours after the rain] but in general, I ſay, it is evident to ſenſe, that the water which falls in rain, or from ſnow, flows down from the ſides of the mountains in ſtreams or torrents towards the lower grounds, and either unites with rivers and with them falls into the ſea, or elſe ſettles at the *bottom* of hills (but not upon the *tops* or *ſides*, from whence ſprings generally riſe, and ſo can afford no ſupply for them); and even from thence is in a few days conveyed away, part of it being evaporated by the heat of the ſun, part carried off by the winds, part ſpent in the nouriſhment of vegetables, and part imbibed by the earth.

But it has been farther aſſerted, *That, ſince in the hotter ſeaſons of the year and in great droughts, when no rain has fallen for ſome time, the ſprings and rivers ſenſibly fail or are diminiſhed; therefore, as their deficiencies are owing to want of rain, their ſupplies muſt be owing to rain.*—But this by no means follows, for the part that rain bears in the ſupply of rivers is only (as we have ſeen already) an *accidental increaſe* or ſwelling of their waters, but has no ſhare in affording a regular and ſufficient quantity of water for their, otherwiſe, *equable* and *conſtant* courſes. And the reaſon why ſprings and rivers fail, or are leſſened, in great droughts, and the hotter ſeaſons of the year, is evident; for during ſuch times the heat of the weather and the action of the Sun-beams upon the

the water at the Spring-head (where the quantity is generally ſmall) and in the channels of rivers, will cauſe the water to be exhaled and evaporated in proportion to ſuch heats and droughts, and therefore ſprings and rivers will proportionably fail. Beſides; in ſuch hot and dry weather, the uſual moiſture of the ground is exhaled, and the ſurface of the earth parched and cracked into chaſms and openings, ſo that the moiſt vapours that ariſe from beneath or from within the earth, (of which more particularly hereafter) and which in a great meaſure afford ſupplies for *ſprings* and even for *rain*, are, when they come to the ſurface of the earth, attenuated, divided, and diſperſed here and there (as our breath, or the fume emitted from our lungs, is in the ſummer-time) by the action of, the ſun-beams or heat in the air, inſtead of being collected and condenſed at and under the ſurface of the earth (as is the caſe during the colder and more moderate months) and ſo ſaturating the vegetable mould, and repleniſhing ſprings, *&c.* And hence it comes to paſs (quite contrary to the hypotheſis of ſprings being derived from rain, *&c.*) that though there falls in *England* and the adjacent countries a *much greater quantity* of rain in *June* and *July* than in *December* and *January*, [g] yet the ſprings and rivers are *much lower* and the earth *more dry* in the two former months than in the two latter; and this certainly happens on account of the greater heat of the ſun, and more copious exhalations from the earth

g WOODWARD's *Nat. Hiſt.* p. 213. MARTYN's *Abridgment of the Memoirs of the Academy of Sciences*, &c. Vol. II. p. 44.

earth and water; whereas in the two other months, the ſun's power is leſs, and the ſurface of the earth cloſed and frozen; ſo that the *inward* or *ſubterranean vapours* are confined, condenſed, and increaſed beneath the earth's ſurface; and hence *ſprings* and *wells* receive a *ſurpluſage* of water, and the *inward parts* of the earth are quite *ſated* or *glutted* with *moiſture*, which collecting into drops falls more plentifully from the tops of caves, grottos, *&c.* during theſe colder months: and yet this is a time when *Rain* is not only leſs in quantity, but leſs able to ſend ſupplies to ſprings, on account of the cloſe union or compaction of the upper parts of the earth; ſo that their ſources muſt lie beneath the earth, and their *ſupplies* be *inward*, not *outward*.

I MAY here juſt obſerve, that as the reſervoir for ſprings is internal, of vaſt extent, and ſituated at too great a diſtance from us to allow us to make immediate obſervations on, ſo many phœnomena may happen at particular times, and in particular places, that may ſeem to contradict the general remarks I have above made; but no ſingle inſtance or partial caſe ought to ſet aſide a general rule. Thus, for inſtance, vaſt quantities of vapours that ariſe from the Abyſs during the emerſion of one or more water-ſpouts at ſea, may have ſuch an effect upon the common ſtate of the air adjoining to ſuch a ſea, that though for the preſent, upon the breaking of the water-ſpout, much and heavy rain may fall, yet ſuch a vent or free paſſage may be hereby given to the ſubterranean vapours, that it might be a long time

before

before ſuch a quantity of them might ariſe again from the Abyſs, and be amaſſed together, as to cauſe a continued rain in ſuch a country. The eruption of a volcano, or the opening of the earth during the time of an earthquake, may afford a ſimilar exit to the vapours, and produce uncommon effects in any particular country. But the moſt uſual cauſe of this kind is the *change of the wind*, which affects the ſources of ſprings as much as any thing I know, and frequently produces phœnomena very contrary to what one might expect from the ſeaſon of the year, or the common courſe of nature. This, though not generally remarked, is noted by the prophet *Hoſea*, ch. xiii. 15. *Though he be fruitful among his brethren, an* EAST-WIND *ſhall come, the wind of the Lord ſhall come up from the wilderneſs, and his* SPRING *ſhall become* DRY, *and* HIS FOUNTAIN *ſhall* BE DRIED UP. One or more of the above cauſes may operate in a *particular place*, at a *particular time*, and produce variations from the commonly-obſerved ſtate of things, and therefore are not to ſet aſide *general rules*, but to be allowed for, or, when they act, to be included under them.

BUT I ſhall now produce an experiment or two of Mr. *de la Hire*, ſufficient to overthrow *this whole theory of the origin of ſprings being owing to rain and vapours*. This gentleman was reſolved to bring this hypotheſis to the teſt of experiments, and to examine it in its *moſt eſſential article*, viz. by endeavouring to find to *what depth* rain or ſnow-water did really deſcend into the earth.

earth. In order to know this,[h] " He dug a hole in the *lower* terras of the Obſervatory at *Paris*, and placed therein, *eight feet* under ground, a large leaden baſon, a *little inclined* towards one of its angles, to which was ſoldered a leaden pipe twelve feet long, which, after a *conſiderable deſcent*, reached into a cellar adjoining. And after having covered the head of the pipe in the baſon with ſeveral flints of different ſizes, to prevent the orifice from being ſtopped, he threw in a quantity of earth of a middle nature, between ſand and loam, (and ſo eaſily permeable by water) to the depth of *eight feet*; and then judged, that if the rain and ſnow-water penetrated the earth to the depth that ſome ſprings are found at (which in digging wells and mines are diſcovered to be at all depths, from eight to eight hundred feet) or 'till they meet with the firſt clayey or compact ſtratum to ſtop them, that then the bottom of the baſon would ſerve to ſtop and collect the water; and by this means there would ſoon be a ſpring burſting forth through the leaden pipe into the cellar. But on the contrary, after having kept the baſon in this ſituation for no leſs than *fifteen years*, and the ground all the while expoſed open to whatever rain, ſnow, or vapours that fell, he could not obſerve that a *ſingle drop of water* had ever paſſed through the leaden pipe into the cellar.

" At the ſame time that he begun the above experiment, he placed another baſon about *eight inches*

[h] See *Memoirs de la Academ.* or MARTYN's *Abridgment*, Vol. II. p. 52, &c.

inches under ground, and choſe a place where the rain and vapours might fall, and yet the ground be ſcreened from the heat of the ſun and the action of the wind, and took care to pull up all the graſs and herbs which grew over the baſon, that all the water, which ſhould fall on the ground, might paſs uninterrupted to the bottom of the baſon, wherein was a little hole, with a tube to convey the water into another veſſel. The effect was, that in all the ſpace of time from the 12th of *June* to the 19th of *February* following (more than *eight months*) no water came by the tube from the baſon; and though it *began to run* on the 19th of *February*, this was intirely owing to the great quantity of ſnow which had fallen, and was *then melting*. From that time the earth in the baſon was always very moiſt, though the water would only run a few hours after raining, and it ceaſed running, when the quantity fallen was drained off.

" A YEAR after, he repeated the ſame experiment, but buried the baſon *ſixteen inches* under ground. He took care alſo that there was no graſs on the ground, and that it might be ſcreened from the ſun and wind, which would dry it too faſt. The effect was much the ſame as in the former, excepting that when a conſiderable time paſſed without raining, the earth would grow a little dry; ſo that a moderate rain coming on, it would not moiſten it ſufficiently to make it run.

" LASTLY, he planted *herbs* on the ground over the baſon, but found, that when theſe were grown

grown up a little, the ground was ſo far from ſending any water after rain, that *all that fell* was *not ſufficient* to *ſuſtain them*, but they would droop and wither, unleſs re-ſprinkled from time to time with water."

THIS, I think, abundantly proves, not only that the rain-water does not penetrate the earth, ſo as to form the ſmalleſt collection of water, above ſixteen or eighteen inches, but that the quantity that falls is *not ſufficient* to furniſh the *quota* requiſite for the *growth of vegetables*; ſo that we muſt call in, as the above-mentioned author remarks, " ſome *foreign aſſiſtance* to ſupport them;" which alſo he found to be true from " *ſeveral experiments* that he made upon the *quantity of water evaporated* through the *leaves of plants*."

AND what he ſays concerning the rain-water not ſinking above ſixteen or eighteen inches in a ſoil of a middle nature, between ſand and loam, I have obſerved to be nearly true even in the moſt lax and gravelly ſoil, ſuch as that in the low lands about *Oxford*, which conſiſts of ſmall round pebbles and ſand. I have examined it frequently after the hardeſt rains, and thoſe of long continuance, but could never perceive that the rain had deſcended (though the ground was upon a level, in a valley, and of a wide extent) above twenty inches, or two feet at moſt; and at about this depth I obſerved in ſeveral places where the earth was opened, that the gravel was uncommonly hard and compact, the parts of it ſo intimately united that it formed a kind of ſtratum,

which in tenacity equalled ſome kinds of ſtrata of ſtone: and upon examining the reaſon of it, I found it to proceed from hence, that the rain-water had drained down as low as this, and here lodged; and as it deſcended, it had carried with it the ſmaller granules of ſand and other finer matter, which, being repoſited among and between the other pebbles, cemented them cloſe together and conſolidated the whole; and that this was the cauſe of their union was manifeſt from the finer matter being affixed to the ſides and under-parts of moſt of the pebbles, juſt in the manner as the draining or laſt ſediment of water would naturally leave it. But, I ſay, after repeated obſervations, I could never perceive that the rain-water had *penetrated through* this compact ſtratum of gravel; and unleſs the rain had been of long continuance, and the weather very moiſt and wet before, I could not find that it had penetrated even thus far; but ſaw plainly that all the rain that fell was not ſufficient for the ſupport and nouriſhment of the herbage and vegetables; which, unleſs they had been aſſiſted by the *foreign ſupply* of the *vapours* that *aſcend from the inſide* of the earth, or which proceed *from beneath* upwards (not thoſe that fall *from the clouds*, or *from above*, downwards) would ſoon have drooped and withered, as thoſe planted by the above-mentioned gentleman did.

It appearing then thus evident, that the origin of Springs and Rivers is not owing to *rain* or *any vapours that may fall from above*, we muſt ſeek for an *internal ſupply*, for a magazine of water underneath

underneath the earth; and how immenſely great this muſt be, I have given the reader reaſon to judge from what has been ſaid at the beginning of this argument, p. 173. But it may be proper (in order to obviate all objections, and entirely to clear the ſubject I am upon) to explain how and by what means the water of this ſubterranean Abyſs is conveyed to the tops of the higheſt mountains, and there breaks out in Springs, *&c.*

Now any one that has but juſt looked into the inſide of the earth, and obſerved the ſtructure of it, cannot but know that the ſtrata or beds of ſtone, *&c.* of which it conſiſts, have innumerable *cracks* or *fiſſures* in them, ſome perpendicular, others oblique, and others horizontal, or rather ſuch as interſect and divide the ſtrata at all angles, and in all directions whatever; and alſo that theſe fiſſures are of various ſizes and capacities, from ſome that are ſeveral feet in breadth to a multitude of others that are not more than a line in width, or even inviſible ('till ſome force be applied to the ſtone, *&c.* and then the ſtone will break into ſmall ſhatters or fragments, and diſcover where theſe cracks were, as every one knows); and it is alſo certain, that ſeveral of theſe fiſſures, or rather theſe diviſions or partings of the regular ſtrata, are filled with a rubbley-kind of matter, conſiſting of a mixture of ſmall looſe ſtones, clay, ſludge and ſand; and that others of them are quite open. [i]

[i] Mr. HUTCHINSON's deſcription of *theſe Fiſſures* (Vol. XII. of his works, p. 309.) is well worth the reader's attention. "The cracks

It is alſo well known to thoſe that are at all converſant in the ſubterranean world, that there is a *moiſt vapour*, or a kind of ſteam continually paſſing, from beneath upwards, through the ſhell or cruſt of the earth; and that this vapour pervades, not only the ſmaller and leſſer fiſſures, but even the interſtices and pores of moſt ſorts of ſtone, *&c.* and that the deeper you deſcend, the more ſenſibly and forcibly this vapour acts or aſcends.[k]

Now

cracks in the ſtrata, after their firſt ſettlement, would be proportioned to the intenſeneſs of the cauſe, the tenacity or coheſion of the matter of the ſtrata, the quantity of water with which they were ſaturated, and the free reception it met with in the cracks. An oak, or other tree, felled, will have cracks in it, more or fewer, wider or ſtraighter, in proportion to the quantity of Sap in it, and to the intenſeneſs of the heat of the Sun. [For which reaſon, to hinder their ſhrinking and cracking, they commonly cover the newly felled tree with boughs.] The cracks commence commonly at the heart of the timber, and tend in rays to the outſide.—It has been already noted, that the fiſſures at the greateſt depth are the largeſt, but the leaſt frequent; aſcending, they become gradually leſs, but more frequent and numerous. Inſomuch that, were the globe divided in two, and theſe ſtrata viewed in profile, the fiſſures would appear much in manner of a tree; at the bottom a large trunk; higher, this divided into great branches; higher ſtill, into leſſer branches; and at top, into twigs." See alſo the explanation of *Plate* the *ſecond*, under the letter F.

[k] Of this Vapour Dr. Derham, in his *Phyſ. Theol. Book* II. *chap.* 5. ſpeaks thus; "That there is ſuch a thing as *ſubterraneous heat* (whether central, or from the meeting of mineral juices, or congenial or connatural to our Globe, I have not time to enquire, but, I ſay, that ſuch a thing is,) is evident not only from the *hot-baths*, many *fiery eruptions* and *exploſions*, &c. but alſo from the *ordinary warmth* of cellars, and places under ground, which are not barely comparatively warm, but of ſufficient heat to raiſe *vapours alſo*; as is manifeſt from the ſmoking of perennial fountains in froſty weather, and water drawn out of pumps and open wells at ſuch a time. Yea, even animals themſelves are ſenſible of it, as particulary *moles*, who dig before a thaw, and againſt ſome other

alterations

Now upon the certainty of theſe two facts (the reality of which any perſon may be convinced of by giving himſelf the trouble of looking into the inſide of the earth) we ſhall be under no great difficulty in accounting *for the aſcent of the ſubterranean water* to the tops and ſides of mountains *for the origin of ſprings, rivers,* &c.

For, *firſt,* ſince the Earth is thus cracked and divided, from the bottom of its ſhell to the top, into an innumerable number of fiſſures of various ſhapes and various ſizes, it cannot but be that the water of the Abyſs pervades theſe cracks, and enters up into them *to a level with the water of the Sea:* for however irregular and winding theſe fiſſures may be, yet it is evident, from the common experiment of immerging ſeveral tubes that are of the moſt different ſhapes and ſizes into a veſſel of water, that the water will riſe to an equal height in each, and be level with the ſurface of the water in the veſſel; and ſo muſt the water of the Abyſs ſtand with reſpect to the ſurface of the Ocean. So that if we were to ſuppoſe the Earth, or rather the mountainous Part of it, to be cut off to a level, or concentrically, with the ſurface of the Sea, it is certain that the fiſſures and chaſms, which communicated with the Abyſs beneath, would be full of water to their very tops, notwithſtanding the Preſſure of the outward Air upon them; for, neither this nor the irregularity of the

alterations of the weather; excited, no doubt, thereunto by the *ſame warm vapours* ariſing in the Earth, which animate them, as well as produce the ſucceeding changes of weather." See alſo what is ſaid, p. 70, note ° with the references.

ſubterranean canals would prevent the water from riſing in every one of theſe fiſſures to a level with the ſurface of the Ocean, as is evident from the above-mentioned well-known experiment. Nay, it will riſe much higher, for (as Dr. *Gualtieri* juſtly obſerves) " Two Liquids of an unequal weight, put in an equal quantity into two equal tubes raiſed perpendicularly upon the ſame plain, have a different height relatively to their weight. This being laid down, it is certain by many experiments, that Sea-water is heavier than freſh-water, and that the gravity of the firſt is to that of the ſecond as one hundred and three to one hundred. And therefore if we ſuppoſe the Sea to be an hundred feet deep, and that the ſea-water, being deprived of its ſalt by filtration, fills up the ſubterraneous paſſages through which it circulates, it may riſe to the height of three feet above the level of the ſea. Now, if we ſuppoſe the ſea to have the depth of an *Italian* mile, which makes five thouſand feet (meaſure of *Bologna*), freſh water may riſe to the height of an hundred and fifty feet above the ſame level. That height of an hundred and fifty feet is already ſomething conſiderable for a mountain. But becauſe ſome are much higher, at the tops of which there are Springs of freſh water, we may obſerve, that in many places, Pilots have not been able to meaſure the depth of the ſea, becauſe they could not find the bottom of it; but though they ſhould find it in ſuch places, one may very well ſuppoſe that there are in them abyſſes, caverns, *&c.* which the plummet does not reach,

and

and which, penetrating into the moſt internal parts of the earth, form a perpendicular column of ſalt-water of an immenſe height."

Now if, under theſe circumſtances, we ſuppoſe the mountainous part of the earth, or that portion of its ſphere which is higher than the ſurface of the Sea (and which we before ſuppoſed to have been taken off) to be re-placed in its firſt and original poſition, ſo that the fiſſures in the mountainous Part ſhall be directly over the fiſſures that are full of water to their tops (as is the real ſituation of them in the preſent ſtructure of the earth) how ſoon, in this caſe, and to what a height would the water of the Abyſs be preſſed up through the fiſſures into the mountains? For now the perpendicular preſſure of the outward Air upon the ſurface of the water in the fiſſures being taken off, or eluded, by the covering of the mountains, or their ſuper-incumbent ſtrata, the ſubterranean water, by the force and action of the outward Air upon the Seas, and the weight of the ſalt-water in the Seas (which communicate, or are one, with the Abyſs), would be forced up through the fiſſures in the mountains *vaſtly above the level of the Sea*; in the ſame manner (to compare great things with ſmall) as water is preſſed up through the pores in a heap of ſand, or through the cracks in a block of ſtone, whoſe bottom or under-part lies immerſed in a pond of water, but whoſe upper part is much above it; for by this ſituation of the Sand or Stone, that part of either which is prominent, or above the water, receives the perpendicular preſſure of the outward air upon

its exterior ſurface, and ſo eludes or weakens the action of the Air upon the water that is under or in the pores of the ſtone; and alſo, comparatively ſpeaking, increaſes the preſſure and ſtrength of the external Air upon the furface of the water in the pond, which therefore will force the water that is leaſt preſſed (*viz.* That which is under and in the pores of the ſtone) to that place where it can find eaſieſt admittance, which will be up into the pores and cracks in the ſtone, as there is the thineſt medium and freeſt paſſage.

Now if we carry this analogy farther, and conſider that the whole ſurface of the earth is compreſſed by the ſtrength of the Expanſe, or the Fluid of the Heavens ſurrounding and binding it on all ſides; and that this Preſſure or Tenſion is ſo very great and ſo cloſely applied to every part, as to preſerve the earth in its preſent ſolid ſtate and circular form (though it be revolved ſo immenſely ſwift upon its axis):[1]—— and when we farther conſider, that, while the external Air or groſſer part of the Heavens (the *Spirit*) preſſes chiefly upon the ſurface, the finer, purer, or the ethereal Part (the *Light*) pervades and reaches the inmoſt receſſes of the earth (for we find that no terreſtrial body can deny it entrance) and penetrates even to the center: and as there is a *new* and *ſucceſſive* ſtream of Light, almoſt inſtantaneouſly, moving or impelled from the Fire at the Sun, and continually preſſing againſt and making its way into the orb of

[1] See alſo what is ſaid of the *Preſſure* of the air, in the note, p. 66.

of the earth (chiefly at or under the torrid Zone), and, having paſſed through the ſhell or the waters of the Ocean, enters into the Abyſs, and there *agitates* and *expands the water:* And as in order to gain itſelf admittance and occupy a ſpace in the Abyſs equivalent to its own bulk or quantity, a proportionable quantity of other matter muſt recede, give way, or paſs out of the earth;[m] ſo this receding

[m] To explain this ſomewhat farther. It is now, I think, univerſally allowed that Light is a *body*, or a *material ſubſtance*. And when we conſider that its particles reflected from a concave ſpeculum, act with ſuch force as to divide and inſtantly to ſplit aſunder the parts of a diamond or the cloſeſt body we know, it muſt be allowed to be a ſubſtance inconceivably *hard* and *ſubtle*; and its *motion immenſely ſwift and ſtrong:* which laſt article is farther evident from the almoſt infinite number of reverberations it will endure from ſpecula to ſpecula, and yet its angle of reflection be equal to its angle of incidence. Such being the Solidity, Subtilty, Activity, and Velocity of Light, no terreſtrial bodies ſurely can prevent its paſſing through their pores, and when we conſider that the Earth has been expoſed to the action of this ſubtle penetrating Agent for *ſeveral thouſand years*, there certainly can be no ſpace in it, that can receive an atom of Light, but what has one; and therefore the Earth from center to circumference is a *Plenum*, or there is no one atom in it but what is in contact with another atom, of ſome kind or other, but chiefly with the particles of Light; as is evident not only from the tenuity of this body which will permeate the pores of any other, but ſince the far greater part of the terraqueous globe is in a ſtate of *fluidity* or conſiſts of *water*; and we know that the action, or comparative non-action of Light, Heat or Fire (for each are the ſame in ſubſtance, and differ only in degree or manner of motion) cauſes the *Fluidity* or *Solidity of water* (its fluid or frozen ſtate); and as the earth is warmer, the deeper we deſcend; and there is an immenſely large ſphere of water in a ſtate of fluidity and motion, or perpetual circulation underneath the earth (as will more evidently be ſhewn hereafter); ſo there muſt be a free admiſſion and full penetration of the particles of Light through that maſs of *water* in order to preſerve it *ſuch*, or keep it in a ſtate ſuſceptible of eaſy motion and briſk circulation. Such being the condition of the earth, and ſince it is impoſſible that any two bodies can ſubſiſt together in one and the ſame place,

receding matter, as it is impelled upwards from the center to the ſurface, would take the eaſieſt and readieſt paſſages it could find, and therefore would endeavour to paſs through the cracks and fiſſures of the earth; but as all the fiſſures that communicated with the Abyſs beneath were before full of water, even to a level with or rather *much higher* than the ſurface of the Sea, ſo this receding matter in its aſcent would certainly contribute towards forcing the water in the fiſſures *ſtill higher up* or nearer to the tops of the mountains: and this its Effect muſt be judged of from the *nature* and *force* of *this receding matter*.

We muſt therefore next determine what *this matter* is. Now *this* can be no other than the above-mentioned *ſubterranean moiſt vapour*, it being certain, that this is inceſſantly paſſing thro' (and we know of no other matter that is ſo) the ſhell of the earth from beneath upwards, or from the center to the circumference; and it anſwers in its nature and form what we might juſtly expect ſuch receding matter to be. For it cannot but be allowed, that, as the Light penetrated into the Abyſs, and protruded or puſhed out other matter to gain itſelf admiſſion, the matter thus driven out would be the fineſt and pureſt that was in the Abyſs, which could be no other than the Light and fine Air that were there before (for it is certain that there is ſome, though very pure air, as well as Light, in the Abyſs, elſe fiſhes could not live

place, it muſt follow, that wherever, in ſuch a *plenum* as the above-mentioned, there is an intruſion of any other body or matter, there muſt be a protruſion of ſome other matter, quantity for quantity.

live and breathe at the bottom of the Ocean; nor the water of the ſprings that are diſcovered at the loweſt depth in the earth be ſo replete with air). Now as this Light and fine Air were puſhed outward, they muſt of courſe paſs through the water of the Abyſs. And as this water had been before rarified and expanded by the colluctation of the atoms of Light between themſelves (and it is not improbable, ſince the earth is of a ſpherical form, that the rays of light which paſs through the Ocean and the Abyſs, on each ſide of the equator, are refracted or converge towards one another till they meet in a focus near the center of the earth; and then the heat and agitation would be much greater) and alſo by their ſtruggle to diſpoſſeſs and drive out the ſubterranean light and air, ſo this light and air thus driven out would ariſe from the Abyſs in form of *ſteam* or *vapour*; which we find actually to be the caſe.

Now this vapour, in its paſſage from the Abyſs through the cracks and pores in the ſtrata of the earth, would not only be a means of elevating the water in thoſe cracks, but would itſelf be turned or *condenſed into water* (as the ſtreams that riſe in an alembick are) as it ſtruck againſt the tops, ſides, and irregular hollows in the fiſſures; and by this repeated action be continually forming into drops, and trickling down the ſides of the fiſſures; and thus, not only increaſe the water that was before paſſing through the fiſſures, but in ſome places, where there were natural baſons or cavities in the rock, be amaſſed in conſiderable quantities.

quantities. And if ſuch baſons or fiſſures happen to be higher than the ordinary ſurface of the earth or than the lower grounds (as is the ſituation of them all in mountains) the water thus collected, or rather inceſſantly collecting, would break out, wherever it could find vent, on the outſide of the mountain, and there form *ſprings*, *rivulets*, &c. But if the baſon or fiſſures in the inſide of the mountain be not higher than the mean ſurface of the earth, or there happen to be any depreſſed or hollow place on the outſide of the mountain, the water that ouzed out of the inſide would then fall into them, and there ſettle; and become either ſmall *pools* or large *lakes*, according to its extent or quantity.

And thus, by this *inward ſupply*, by the aſcent of the *ſubterranean water* and *vapour*, there will be a conſtant Fund and ſufficient Source of water for the production of *Springs*, *Rivers*, *Lakes*, &c. throughout the whole earth.

But there is a difficulty attending this account of the origin of Springs which may be thought too material to be paſſed by without a ſolution: and that is—*That if Springs derive their water from the Sea, or from the Abyſs which communicates with the ſea, how comes it to paſs, that Spring-water is not ſalt and briny, like the ſource from whence it proceeds; but on the contrary is generally freſh and ſweet, or inſipid?*

Now ſuppoſing the Abyſs beneath the earth to be ſalt like the Sea (which yet we can have no abſolute proof of; and I could give ſeveral reaſons to ſhew, that it may not be ſo; at leaſt, not equally ſalt with the Sea) yet we may ſolve the difficulty

difficulty upon the following facts and obſervations.

Firſt, LET it be remarked, that Sea-water may be diveſted of its ſaline particles, and is frequently rendered *freſh* in a *natural* way;—the vapours that are exhaled from the ſea, and which fall again in freſh ſhowers of rain, is one proof of this;—and the fleſh of fiſh, which are caught, and which before lived and fed, in the Sea, being ſweet, is another proof of it;—and from an experiment which Mr. *Liſter*[n] made, it is certain, that the water, which is *ſucked up* (as we commonly ſay) or rather impelled and ſtrained through the tubes and veſſels of the *Alga marina* or common *Sea-weed*, is freſh, ſweet and potable; though the diſtillation be made from a baſon full of ſalt-water. Or, what is more applicable to the preſent caſe, Monſ. *Marſilli*, having filtrated a certain quantity of the ſalteſt and heavieſt Sea-water he could procure through ſeveral veſſels filled with ſand, all which together made up a cylinder of ſand of ſeventy-five inches in depth, found, that the water had loſt near one half of its degree of ſaltneſs; and concluded that, had it been ſtrained again through twice the ſame quantity of ſand, it would have been entirely deprived of its ſaline particles;[o] or we may ſafely ſay, that had it paſſed through a cylinder of ſand, conſiſting of as many feet as the above did of inches, it would have been as pure and freſh as the water of the wells of St. *Mary*'s on the ſhore of *Languedoc* in *France*, which,

[n] *Phil. Tranſ.* N° 156, or LOWTHORP's *Abridg.* Vol. II. p. 297.
[o] DE LA MER. p. 33.

which, *Marſilli* ſays, are not more than ſixty feet diſtant from the neareſt place where the Sea-water reaches. [p] Here then are ſeveral ſtrainers, or means, by which *Sea-water* may be *percolated* and *rendered freſh*, in an *eaſy*, *natural*, *and expeditious way*.

Now though the pores of the earth are larger or more open than the ſtrainers here mentioned, yet when we conſider the bulk of the earth or the thickneſs of its ſhell, the great variety of ſtrata of which it conſiſts, the many turnings and windings of the fiſſures (by means of which the ſubterranean water may paſs through this variety of ſtrata), the thick groſs vapour that is continually paſſing through the whole body of the earth, and the great quantity of Sea-weed and other marine productions that are at the bottom of the Ocean, eſpecially in ſuch calm and quiet places as the cavities at the mouths of the fiſſures; [q] I ſay, taking all theſe into conſideration, which may be eſteemed as ſo many *percolators*, and though more open and porous than the above-mentioned, yet, by the *length* of their *courſes* and the *variety* of their *ſubſtances*, they will certainly anſwer the end of the afore-mentioned. And this appears to be fact from hence, that in ſuch places where the Sea-water has admiſſion into the earth, the Springs and Wells are more or leſs brackiſh, as they are nearer

[p] De la Mer. Ibid.

[q] When *Jonah* was in the *fiſh's belly*, he ſays, chap. ii. *I went down to the bottoms* [marg. *cuttings off*] *of the mountains* [theſe *apertures* in the ſhell of the Earth which open into the Abyſs and are really the loweſt parts or bottoms of the mountains]. *The Depth* [the Abyſs] *cloſed me round about; the weeds* [the ſea-weeds] *were wrapt about my head.*

nearer to or farther from the Sea. Thus Mr. *Norwood*, ſpeaking of the *Bermuda* iſlands, ſays,[r] " We dig *Wells* of *freſh water* ſometimes within twenty yards of the ſea, or leſs; which riſe and fall upon the Flood and Ebb, as the ſea doth; as do moſt of the wells in the country, though farther up (as I am informed). Whereſoever they dig wells here, they dig 'till they come almoſt to a level with the ſuperficies of the ſea, and then they find either *freſh water* or *ſalt*. If it be *freſh*, yet if they dig two or three feet deeper, or often leſs, they come to *ſalt water*. If it be a *ſandy ground*, or a *ſandy crumbling ſtone*, that the water *ſoaks gently* through, they find uſually *freſh water*; but if there be hard lime-ſtone rocks, which the water cannot ſoak through, but paſſeth in chinks or clefts between them, the water is *ſalt* or *brackiſh*." *Varenius* relates the ſame of ſeveral places, and obſerves, " that Springs near the Ocean are ſalt or brackiſh; and the nearer they are the ſea, the more they are ſated with ſalt; as on the ſhore of *Africa*, and in *India*, chiefly on the ſhore of *Coromandel*, where no vines grow, and all their wells taſte ſalt. Near the town of *Suez*, at the end of the *Red Sea*, their ſprings are all ſalt and bitter; and even the water which is fetched two *German* miles from the ſhore taſtes a *little brackiſh*. Alſo in ſeveral ſmall iſlands there are no freſh ſprings but all ſalt (though ſomething *leſs ſated* than the Ocean) as in the iſland of St. *Vincent*, and others. In the low countries of *Peru* that border upon the Ocean, their Lakes are *ſaltiſh*, becauſe of the vicinity

[r] Lowthorp's *Abridg.* Vol. II. p. 298.

vicinity of the Sea."[s] But farther up in the inland countries, it is well known, that the Springs and Lakes are freſh and ſweet. Hence then we may fairly conclude, that the water of the Ocean and the Abyſs is, by a *gradual filtration* thro' the ſtrata of the earth, ſo ſtrained and purified as to leave behind all its ſaline or briny particles, and when it arrives at a due diſtance (either greater or leſs, according to the poroſity or tenacity of the ſtrata it paſſes through) from its original reſervoir, there to become *ſweet* and *freſh*, or at leaſt diveſted of its primitive qualities.

A FARTHER proof, that the water of the Abyſs, in its paſſage through the ſtrata of the earth, depoſits its ſaline particles, may be drawn from the peculiar qualities of *mineral Springs*; of which there are almoſt an infinite number, differing from each other in the moſt diſtinguiſhable properties, according to the particular ſpecies of the mineral or metallic effluvia they are impregnated with; and though ſeveral of theſe have a ſaltiſh taſte, yet it is well known, that even That proceeds from other ſalts than thoſe which the Sea-water is replete with. Whence it muſt follow, that all mineral waters, before they arrive at their outlets, have not only depoſited their ſaline particles, but even aſſumed others, very different and diſtinct therefrom. And ſince this is the caſe, we may fairly ſuppoſe, that where the ſubterranean water paſſes through ſtrata that have no proper, or no great quantity of proper, matter for the production

[s] VARENIUS's *Geography*, Part I. ch. xvi. Propoſition 5.

duction of mineral waters, that there it will break out in ſprings of pure and freſh water.

It may not be amiſs to obſerve in this place that, upon the ſuppoſition of Springs being owing to rain or vapours, that fall upon and make their way through the outſides of the mountains to the places from whence they riſe, it is altogether abſurd and impoſſible to conceive, that the *ſmall portion of the earth* which lies above ſeveral mineral ſprings, eſpecially ſuch as break out near the tops of the higheſt mountains, can be ſufficient for affording a *conſtant* and *equable ſupply* of *mineral matter* for the *impregnation* of them. Beſides; it is well known, that in ſuch places where mineral Springs are, and there happen to be any cavities open at the ſurface of the earth, or any chinks or crevices in the rock, through which the rain-water may deſcend and gleet down to the fiſſure through which the mineral water flows, that in ſuch caſes the rain-water is ſo far from increaſing the virtues of the Spring, that it either deſtroys or leſſens them for a time, and renders ſuch as are hot and warm cold or cool, ſuch as are acrid and bitter ſomewhat ſweet or leſs acrid, and ſo of the reſt; which plainly ſhews, as I obſerved before, that when rain-water permeates the earth, and reaches the water of Springs, it only makes an *accidental* or *temporary* increaſe, but does not afford the *conſtant* and *regular flux*; and is ſo far from being the Source of *mineral water*, or bringing down any matter proper for the production or continuance of ſuch Springs, that, where it reaches them, it in part deſtroys their

qualities; which, I may obſerve, the Springs *recover again* when the rain is over; ſo that their ſupplies cannot be owing to rain: and we muſt ſeek deeper for their ſources than that ſmall portion of the earth which rain-water penetrates; and therefore muſt have recourſe to a *ſubterranean reſervoir*.

And upon the ſuppoſition of an Abyſs of water beneath the earth, as the grand fund or promptuary of all Springs, there is the whole thickneſs of the ſhell of the earth, conſiſting of a variety of different ſtrata, filled with a variety of ſoluble mineral and metallic particles, and the fiſſures full of a groſs watery vapour, that has paſſed through the neighbouring ſtrata at every crack and cranny, replete with the mineral or metallic effluvia that it has brought out of theſe ſtrata;—there is all this, I ſay, for the waters of the Abyſs to make their way through, before they break out in ſprings on the ſurface of the earth. So that there is reaſon to believe, that ſome mineral waters may have loſt their original properties, gained others, loſt them, and have regained their original or others of the ſame kind, before they appear as *Springs*; and certain it is, that ſeveral of them come up endued or impregnated with a variety of mineral qualities, and thereby ſhew the large ſpace they have ranged through for the acquiſition of them.

And though the *mouths* or *firſt paſſages* of the fiſſures that reach from the Abyſs to the ſurface of the earth are probably large, and ſo open as to admit freely to ſome diſtance the ſubterranean water,

water, endued with its peculiar properties, whether ſaline, or whatever they are; yet as theſe fiſſures gradually leſſen as they tend towards the ſurface of the earth, and frequently break off, or run into other fiſſures that are of an horizontal or oblique ſituation, which again divert and branch off into others ſtill leſs, and ſome ſo ſmall as to be inviſible; ſince many of theſe fiſſures are filled with a rubbley kind of matter, as ſand, clay, ſludge, ſmall ſtones, *&c.* and ſo fit for ſtraining and refining the water; ſince the ſubterranean vapour, by being condenſed againſt the tops and trickling down the ſides of the fiſſures, is continually adding freſh ſupplies of water that has been purified or deprived of its original properties by evaporation and diſtillation; and ſince there is a perpetual ouzing of water into the larger fiſſures through the cracks and crannies in their ſides; to which "continual diſtilling alone, gleeting, or ſtraining of the watery particles through the terreſtrial ſtrata" *Varenius* attributes the depriva-tion of the ſaline particles in the ſea-water; and juſtly remarks, "that we obſerve this very thing in mines digged to a vaſt depth (and the deeper we deſcend, the more diſcernible it is), how that water on every ſide is continually dropping, and collecting itſelf into ſmall guts, which are called veins of water; and if ſeveral ſuch guts or runnels as theſe concur in one receptacle, they form a fountain, as they who make drains, to bring water into wells, very well know."[t]—— Now all theſe circumſtances being added to-

 gether,

[t] *General Geog.* p. 305.

gether, we certainly have a ſolution to the above-mentioned difficulty, and have reaſon enough to conclude, that the water of the Abyſs, in its paſſage through the ſtrata of the earth, is deprived ſeveral times of the different qualities it gains, and therefore, ſoon after its permeation, is entirely diveſted of its ſaline or original properties, whatever they be.

THUS, I hope, I have now cleared my way, and ſufficiently anſwered every material objection, and plainly ſhewed, that the origin of Springs is owing to an internal ſupply; the water of which, —by the general action of the Air upon the Seas and (by their communication) upon the Abyſs, and by the receſs of the finer Air and Light from the center of the earth to the circumference— is impelled or preſſed up through the cracks and fiſſures in the terreſtrial ſtrata to the tops of the higheſt mountains. And as there are *Springs* breaking out all over the ſurface of the earth, as well in the moſt inland as the maritime parts; and theſe Springs are the *Heads* or *Sources*, from whence that profuſion of water proceeds which affords the conſtant, uninterrupted, and regular ſtreams or courſes of all the numerous rivers upon the earth, it muſt follow that there is an *internal magazine* or an *Abyſs of water beneath the earth*; and that this *Abyſs* is alſo *equal in extent* to the lower part of the ſhell of the earth.

So that as I before argued, that, from the quantity of water poured into the Ocean from the *mouths* or at the *ends* of all the rivers upon the earth, there muſt be an immenſely large Receptacle

tacle *beneath the Ocean* for containing it, ſo from the quantity that is thrown out at the *Heads* or *Sources* of all the rivers, there muſt be a Reſervoir *beneath the earth* for ſupplying this; and if theſe two Conſervatories were not full and in union with each other, there muſt ſoon appear a great ſuperfluity in one, or a great deficiency in the other; but as neither of theſe is obſerved, they muſt be in conjunction, and a mutual interchange and perpetual circulation be maintained between them. And hence is evident that two-fold ſcriptural argument *Eccleſ.* i. 7. the firſt part of which I have already quoted, proved, and ſhewn the reaſon of from Nature; and by now adding (ſince I have proved) the ſecond, they will, when united, corroborate each other;—*All the rivers run into the Sea, yet the Sea* [the *general collection* of waters, including the Sea and the Abyſs; ſee page 43, and p. 64.] *is not full*;—*unto the place from whence the rivers come, thither they return again.*

And, I hope, it now at laſt appears, from all that has been ſaid, to be no more wonderful that there ſhould be a circulation of waters throughout the earth, and that Springs ſhould break out on the tops of the higheſt mountains, than that there ſhould be a circulation of blood in the human body, and that a man ſhould bleed, when pricked, in the veins or arteries of his forehead, as freely as in thoſe of his feet. For the ſame Cauſe produces both theſe effects. The Blood—by the preſſure of the outward Air or Atmoſphere upon, and by the penetration of the finer Air and

Light into, the human body—is impelled or ejected from the Heart (the Center) into the arteries to the extremities of the body, and from the arteries is forced into the veins, and by the veins is refunded back into the heart: ſo the ſubterranean or central Water, by the ſame Agents and after the ſame manner, is preſſed up through the veins or fiſſures in the earth to its extremé or higheſt parts, and from thence is conveyed down, through the channels of rivers, into the Sea, and from the Sea is returned into the Abyſs from whence it firſt came. And the *aſcent* of theſe two Fluids (the Blood and the Water) is as natural as the *deſcent*; for neither of them having any *innate Gravity* or *Levity*, but, like all other matter, being indifferent and therefore ſubject to motion any way, they are moved either up or down, this way or that, juſt as they are impelled by the univerſal Agents *Light* and *Air*.

And however *novel* this account of the origin of Springs may ſeem to many at preſent, yet it is certain that it has the ſanction of *antiquity*, both *ſacred* and *prophane*, on its ſide; as is evident from what has been ſaid page 43 & *ſeq*. but more particularly may appear from the ſentiments and reaſonings of *Pliny* and *Seneca* on this head; which I ſhall inſert as far exceeding thoſe of many of our modern philoſophers.

Pliny in his *ſecond Book* of *Natural Hiſtory*, chap. LXV. writes thus, " Ita formaſſe artifex natura credi debet, ut cum terra arida & ſicca conſtare per ſe ac ſine humore non poſſet, nec rurſus ſtare aqua, niſi ſuſtinente terra, mutuo implexu jungerentur;

jungerentur; hac ſinus pandente, illa verò permeante totam, intra, extra, ſupra, venis, ut vinculis, diſcurrentibus, atque etiam in ſummis jugis erumpente: quo ſpiritu acta & terræ pondere expreſſa, ſiphonum modo emicat: tantumque a periculo decidendi abeſt, ut in ſumma quæque & altiſſima exiliat. Qua ratione manifeſtum eſt, quare tot fluminum quotidiano acceſſu maria non creſcant." *i. e.* "This we muſt believe, that nature the work-miſtreſs framed and ordained ſo, to the end that the *earth*, which being *dry* could not by itſelf alone, *without ſome moiſture*, keep any *conſiſtency*; and the water likewiſe could not abide and ſtay, unleſs the earth upheld it, in which regard they were *mutually to embrace each other*, and ſo be united; the earth opening a boſom for the water, and the other permeating the whole by means of *ſecret veins*, *within*, *without* and *above*, which, like ligaments, were to claſp it, and *ſo break out at laſt* upon the *outmoſt tops of hills*: whither *being driven by the Spirit* [*i.e.* Air in motion], and partly preſſed by the weight of the earth, it *aſcendeth* as it were *in a Siphon*; and ſo far is it from falling down again, that it readily mounteth to the higheſt and moſt lofty places. Whence alſo is evident, why the *Seas* do *not increaſe* and ſwell, though they *daily receive* ſo *many rivers*."

Seneca in his *third Book* of *Natural Queſtions*, chap. IV. argues thus, "Primum ergo quæramus, quomodo ad continuandos fluminum curſus terra ſufficiat, unde tantum aquarum exeat. Miramur quod acceſſionem fluminum maria not ſentiant,

tiant. Æque mirandum eſt quod detrimenta exeuntium terra non ſentit, *&c.*" *i. e.* "Let us firſt enquire, how the earth can ſupply the continual courſes of rivers, from whence proceed ſo great quantities of water. We wonder that *the ſeas ſhew no marks of the acceſſion of rivers.* And it is equally wonderful, *that the earth diſcovers no ſigns of the loſs of thoſe rivers that iſſue from it.* What is it that thus ſupplies it, that it can afford ſo much in ſecret and be repleniſhed again?—What we have ſaid concerning rivers, the ſame is to be underſtood of brooks and fountains.

"SOME think that whatever water the earth emits ſhe receives again: and for this reaſon the ſeas do not increaſe, becauſe they convert not that which flows into them to their own uſe, but immediately ſend it out. For the ſea penetrates the earth by a ſecret paſſage and diſcovereth itſelf again, and then ſecretly returns and is purified in its courſe; for being ſqueezed and ſtrained through the manifold turnings and windings in the earth, and the variety of ſoils it paſſeth through, it depoſits its bitter and ſalt quality and becomes freſh water."

"QUIDAM exiſtimant, quicquid ex imbribus terra concipit, in flumina rurſus emitti, *&c.*" *i. e.* "Some think, *that whatſoever the earth receives from rain, is returned again into the rivers.* And they build their opinion upon this argument, that there are few rivers in thoſe countries where it ſeldom raineth. Therefore they ſay the deſerts of *Æthiopia* are dry, and there are few Springs to be found in the inward parts of *Africa*; becauſe

cauſe the nature of the climate is very hot, and it is almoſt always Summer. Theſe ſandy deſerts therefore lie uncultivated, without trees or herbage, being ſeldom ſprinkled with rain, and when they are, it is immediately ſucked up. But on the contrary, it is well known that *Germany*, *Gaul*, and *Italy* abound with brooks and rivers; becauſe the climate is moiſt, and even the Summer not without ſhowers.

" ADVERSUS hæc multa dici poſſe vides. Primum ego tibi, vinearum diligens foſſor, affirmo, nullam pluviam eſſe tam magnam, quæ terram ultra decem pedes in altitudinem madefaciat, *&c.*" *i. e.* " Againſt this opinion many things, you ſee, may be urged. For firſt, *I, who have been a diligent digger of vineyards*, affirm, that there is no rain ſo great that wetteth the earth more than *ten feet* deep: all the humidity is conſumed in the upper cruſt and deſcendeth not into the lower parts. How therefore can rain ſupply ſtrength and quantity of water to rivers, when it wetteth only the upper ſurface of the ground? The greater part thereof is carried by the channels of rivers into the ſea. It is but *little* that the earth abſorbs, and doth not preſerve this, for it is either *dry*, and then ſucks up what falls upon it; or *glutted*, and then it refuſeth to receive what is too laviſhly poured upon it from the heavens. And therefore rivers are not increaſed upon the firſt rains, becauſe the dry earth abſorbs them all. What ſhall we ſay of thoſe rivers which iſſue out of rocks and mountains? What ſupply can they receive from rain which quickly paſſeth over the naked rock, and

hath

hath no earth to ſtay upon?"—" Adjice, quod in ficciſſimis locis, putei in altum acti, per ducenum aut tricenum pedum ſpatia, inveniunt aquarum uberes venas, in ea altitudine, in quam aqua non penetret, *&c. i. e.* " Add to this, that in the drieſt places where wells are dug *two or three hundred feet deep*, there are found plentiful veins of water at a depth which rain or common water could not have reached: ſo that you may know that it was not from the heavens or accidentally collected there, but was what we commonly call *living water*. This opinion is farther confuted by the conſideration that there are *ſprings* upon the *very ſummits* of *mountains*; whence it is apparent that their waters were either carried up thither, or produced originally there, ſince all rain-water naturally falleth downwards. Some think, that as upon the *exterior part of the earth* there are vaſt marſhes, even great and navigable lakes, and that as the ſeas are extended over great part of the earth, and even reach into the vallies, ſo the *inward parts of the earth* abound with *ſweet waters*, which ebb and flow like the ocean and its arms; and are extended through the earth in proportion to the height and quantity of land above them. *Therefore, from this profuſe plenty rivers are derived. Which, why wondereſt thou, if the earth ſhew no ſigns of their being taken from her, when the ſeas diſcover no mark of their being added to them?*"

As a final proof of the poſſibility of the circulation of water from the ſea into the Abyſs, and from the Abyſs, through the channels of ſprings and

and rivers, into the ſea again, I ſhall endeavour to give the reader a deſcription of a glaſs tube that I have, invented by a foreigner, in order to repreſent this very thing. The tube is three feet three inches high, and fixed to a board (as barometers uſually are) about a foot broad: near the top it is globular, and ſwells out ſufficiently to hold a quart of water, from whence it is continued of a leſs ſize (about half an inch bore) to the bottom, where it is curved upwards, and ſwells out again into a globular form (of the ſame ſize with the upper globe) and from thence it is continued, about the dimenſion and bore of a gooſe-quill, in the moſt irregular mæander-like manner to the top, where it is curved downward and meets the upper globe. In the inſide of the lower globe, one part of the tube is ſo contracted as to form a fit paſſage for a ſpring or *jet d'eau* to ariſe from it. Upon pouring water into this tube (through a cavity made in the upper part for that purpoſe) and permitting it to riſe ſo high as to fill the upper globe, a ſpring will immediately be formed in the inſide of the lower globe by the bare weight or preſſure of the water endeavouring to riſe to its level, and by the ſpring's agitating the air in the inſide of this lower globe, the water will be impelled upwards through the ſmall irregular part of the tube, riſe above its level, and fall into the upper globe; and thus cauſe a conſtant circulation as long as any water remains in the upper globe. In this tube (which is but a little more than three feet high) the water will riſe fourteen inches above its level. Now if we

we ſuppoſe the upper globe to repreſent the *Sea*, the lower globe the *Abyſs*, and the *jet d'eau* riſing in it to be a *Spring* breaking out from the Abyſs into any hollow part of the earth, and from thence continued through the ſmall winding fiſſures to the ſurface, and from the channels of the river into the ſea again; the one may be allowed a proper repreſentation of the other, or at leaſt an experimental demonſtration of the poſſibility of ſuch a circulation. It may be proper to remark, that the air in the inſide of the tube is in the ſame ſtate as without, with regard to any preter-natural or artificial condenſation or rarefaction thereof; and by an accident the top of the tube once received a fracture, and ſo large that the outward air had free entrance, and yet the circulation continued juſt the ſame.

III. *Thirdly.* ANOTHER Proof of a *Subterranean Abyſs of water* may be drawn from *Whirlpools*, *Under-currents*, and *Gulphs* in the Ocean.

OF the firſt of theſe is that remarkable *Whirlpool* upon the coaſt of *Norway*, which is thus briefly deſcribed by *Gordon* in his *Geographical Grammar*, p. 76. "Upon the coaſt of *Norway*, near the iſle of *Hitteren* in the latitude of ſixty-eight, is that remarkable and dangerous whirlpool, commonly called *Maelſtroom*, and by navigators *the Navel of the Sea*. Which whirlpool is, in all probability, occaſioned by ſome *mighty ſubterranean Hiatus*, and proves fatal to ſhips that approach too nigh, provided it be in the time of flood; for then the ſea, upwards of two leagues round,

round, makes ſuch a terrible *Vortex*, that the force and in-draught of the water, together with the noiſe and tumbling of the waves upon one another, is rather to be admired than expreſſed. But, as in the time of flood, the water is drawn in with a mighty force, ſo during the tide of ebb does it throw out the ſea with ſuch a violence, that the heavieſt bodies then caſt into it cannot ſink, but are toſſed back again by the impetuous ſtream which ruſheth out with incredible force. And during that time is abundance of fiſhes caught by fiſhermen who watch the opportunity; for being forced up to the ſurface of the water, they cannot well dive again, ſo violent is the riſing current." Some have imagined from the circumſtance *of the bodies that are thrown into this Vortex being returned again*, that therefore there is only a great Cavity with a confined bottom, but no Hollow or Paſſage through the ſhell of the earth. But were there not a free paſſage for the waters through the whole ſhell of the earth, I cannot ſee how they could return with ſuch impetuoſity as here deſcribed, and the reaſon, why the bodies thrown in do not totally diſappear but are caſt back again, is in all probability owing to the *irregularity* of the aperture or channel of this Vortex being in ſome places narrower, in others broader, as is the form of the natural cavities in the earth, and even of thoſe in the Sea, where we can viſit them, as witneſs thoſe remarkable ones in the bottom of *Zirchnitzer Sea* in *Carniola*, deſcribed in the *Phil. Tranſ.* N° 54, 109, 191.

AGAIN; "The *Caſpian Sea* (ſays *Stackhouſe* in his *Hiſtory of the Bible*, Vol. I. p. 122, citing for proof *Moll*'s *Geography*, p. 67. *Stillingfleet*'s *Orig. Sacr.* l. 3. c. 4. and *Bedford*'s *Scripture Chronology*, c. 12.) is reckoned in length to be above an hundred and twenty *German* leagues, and in breadth from eaſt to weſt about ninety of the ſame leagues. There is no viſible way for the water to run out, and yet it receives in its boſom near an hundred large rivers, and particularly the river *Volga*, which of itſelf is like a Sea for largeneſs, and is ſuppoſed to empty ſo much water into it in a year's time, as might ſuffice to *cover the whole earth* [ſee p. 105.]; and yet it is never increaſed nor diminiſhed, nor is obſerved to ebb or flow, which makes it evident, that it muſt neceſſarily have a *ſubterraneous communication* with other parts of the world. And accordingly, Father *Avril*, a modern traveller, tells us, that near the coaſt of *Xylan* there is in *this Sea* a *mighty Whirlpool*, which ſucks in every thing that comes near it, and conſequently has a Cavity in the earth, into which it deſcends."

OF a ſimilar nature, and of the ſame name with the above Sea, is another in *Hiſpaniola* in the *Weſt-Indies*, "which (as *Peter Martyr* in his *Hiſtory of the Weſt-Indies*, p. 135, informs us) conſiſts of ſalt, ſour, and bitter water, as we read of the Sea called *Caſpium*, (lying in the firm land between *Sarmatia* and *Hircania*); we have therefore named it *Caſpium*. It hath many *ſwallowing Gulphs*, by which both the water of the great Sea ſpringeth into it, and alſo ſuch as fall into it from the mountains

mountains are ſwallowed up. The rivers which fall into this Lake or Sea are theſe; from the North, *Guanicabon*; from the South, *Xaccoci*; from the Eaſt, *Guannabo*; and from the Weſt, *Occoa*: they ſay, that theſe rivers are great and continual, and that beſides theſe there are twenty other ſmall rivers which fall into this *Caſpium*. This Lake is toſſed with ſtorms and tempeſts, and often drowneth ſmall ſhips or fiſher's boats, and ſwalloweth them up with the mariners, inſomuch that it hath not been heard of, that any man drowned by ſhipwreck was ever caſt on the ſhore, as commonly chanceth of the dead bodies of ſuch as are drowned in the Sea."

Of *Under-Currents*, Dr. *Smith* in the *Phil. Tranſ.* N° 158. writes thus, " In the *Offing*, between the *North-foreland* and *South-foreland*, it runs tide and half tide, that is, it is either ebbing water or flood upon the ſhore, in that part of the *Downs*, three hours, (which is, groſsly ſpeaking, the time of half a tide) before it is ſo off at ſea. And it is a moſt certain obſervation, that where it flows tide and half tide, though the tide of flood runs aloft, yet the tide of ebb runs under foot, that is, cloſe by the ground; and ſo at the tide of ebb it will flow under foot. There is a vaſt draught of water poured continually out of the *Atlantic* into the *Mediterranean*, the mouth or entrance of which between *Cape Spartel* or *Sprat*, as the ſeamen call it, and *Cape Trafalgar*, may be near 7 leagues wide, the current ſetting ſtrong into it, and not loſing its force 'till it runs as far as *Malaga*, which is about twenty leagues within the

the *Streights*. By the benefit of this current, though the wind be contrary, if it does not overblow, ſhips eaſily turn into the *Gutt*, as they term the narrow paſſage, which is about twenty miles in length. At the end of which are two towns, *Gibraltar* on the coaſt of *Spain*, which gives denomination to the Streights, and *Ceuta* on the *Barbary* coaſt; at which *Hercules* is ſuppoſed to have ſet up his pillars. What becomes of this great quantity of water poured in this way, and of that which runs from the *Euxine* into the *Boſphorus* and *Propontis*, and is carried at laſt through the *Helleſpont* in the *Ægean* or *Archipelago*, is a curious ſpeculation, and has exerciſed the wit and underſtanding of philoſophers and navigators. For there is no ſenſible riſing of the water all along the *Barbary* coaſt even down to *Alexandria*; the land beyond *Tripoli* and that of *Egypt* lying very low, and eaſily overflowable. They obſerve indeed that the water riſes three feet, or three feet and a half, in the Gulf of *Venice*, and as much, or very near as much, all along the *Riviera* of *Genoua*, as far as the river *Arno*: but this rather adds to the wonder. My conjecture is, that there is an *Under-current*, whereby as great a quantity of water is carried out as comes flowing in. To confirm which, beſides what I have ſaid above, about the difference of tides in the *Offing*, and at the ſhore in the *Downs*, which neceſſarily ſuppoſes an Under-current, I ſhall preſent you with an inſtance of the like nature in the *Baltick Sound*, as I received it from an able ſeaman, who was at the making

of

of the trial. He told me that, being there in one of the king's frigates, they went in their pinnace into the middle ſtream, and were carried violently by the current; that ſoon after they ſunk a bucket with a very large cannon-bullet to a certain depth of water, which gave a check to the boat's motion; and ſinking it ſtill lower and lower; the boat was driven a-head to the windward againſt the upper-current; the current aloft, as he added, not being above four or five fathom deep, and that the lower the bucket was let fall, they found the under-current the ſtronger."

So alſo *Marſilli* (as quoted by Mr. *Ray* in his *three Phyſico-Theological Diſcourſes*, p. 81.) affirms, "That the lower water in the channel of the *Thracian Boſphorus* is driven *Northward* into the *Euxine* Sea, whilſt the upper flows conſtantly from the *Euxine Southward*. And that that which flows from the South is ſalter and heavier; which he found by letting down a veſſel cloſe ſhut up, fitted with a valve to open at pleaſure and let in the lower water, which, being brought up and weighed, was obſerved to be ten grains heavier than the upper. That the upper and lower flow contrary ways he found by the fiſhermen's nets, which, being let down deep from veſſels that were fixed, were always, by the obſervation of the fiſhermen, by the force of the current driven towards the *Black Sea*: and by the letting down of a plummet; for if it were ſtopped and detained at about five or ſix feet depth, it did always decline towards the *Marmora* or *Propontis*, but if it deſcended lower, it was driven to the contrary

part, that is, the *Euxine*." And though Mr. *Ray* ſpeaks of this (and alſo of the Under-current at the *Streight*'s *Mouth*) as being " the concurrent and unanimous vote and ſuffrage of mariners, voyagers, and philoſophers," yet he ſeems to make a doubt of it, becauſe, ſays he, " I do not underſtand how waters can run backward and forward in the ſame channel at the ſame time; for there being but one declivity, this is as much as to affirm that a heavy body ſhould aſcend." But ſurely Mr. *Ray* may eaſily conceive, how water may be made to run into a veſſel or pond at one part, and be made to run out in a contrary direction at the bottom by means of a cavity beneath, and ſo two different currents be formed; which certainly is the caſe in the above-mentioned ſeas; there being a great cavity or aperture at the mouths of each leading into the Abyſs beneath, which cauſes a current different from, and in a contrary direction to, that which appears upon the ſurface of the waters.

VARENIUS (in his *Syſtem of Geography*, Chap. iv. Sect. iv.) gives an account of the ſeveral principal Currents in the Ocean; ſome of which are certainly owing to *ſubterranean gulphs* or paſſages that lead under the earth, particularly the two that follow, (as he himſelf imagines) ſince they ſet in towards the Shore; 1. " The moſt extraordinary Current of the ſea is that by which part of the *Atlantic* or *African* Ocean moves about *Guinea*, from *Cape Verd* towards the curvature or bay of *Africa*, which they call *Fernando Poo*, *viz.* from Weſt to Eaſt, which is contrary to the general

general motion. And ſuch is the force of this current, that when ſhips approach too near the ſhore, it carries them violently towards that bay, and deceives the Mariners in their reckoning.—This current affects not the whole *Ethiopic* Ocean, only that part which is adjacent to the ſhore of *Guinea*, to the end of the bay, and to about one degree of ſouth latitude. It is obſerved not to exceed the diſtance of fourteen miles from the ſhore; therefore ſhips are very careful leſt they ſhould approach ſo near, when they ſail along theſe coaſts; which would hinder their intended courſe, and drive them to a place they would not care to viſit. 2. The ſecond perpetual current is where the Ocean moves ſwiftly from about *Sumatra* into the bay of *Bengal*, from ſouth to north [that is from the ſea towards the ſhore]; ſo that it is probable this bay was made by the rapidity of the current. I do not know whether the cauſe may be owing to the many iſlands, and to cape *Mabo*, upon the ſouth continent, whereby the ocean in its paſſage weſtward may be diverted northwards, or there may be a ſubterraneous Receptacle in the bay itſelf."

The reader may ſee deſcriptions of ſeveral other leſſer Gulphs, Whirlpools, and Under-Currents in the Sea in *Kircher*'s *Mundus Subter*. *Lib*. ii. & iii. and from viewing and conſidering the number and ſituation of them, we may reaſonably conclude that there are few or no Seas without one or more of ſuch Gulphs, and conſequently that there is *an immenſe quantity of water daily poured*

into the inſide of the earth through the mouths of them all.

And here, by the way, I may juſt animadvert upon the inaccuracy of thoſe writers who have endeavoured to prove, by exact mathematical calculation (which proves juſt nothing at all when founded on falſe facts), that the quantity of water which is raiſed from the Ocean in vapour is equal to that which is poured into it by all the rivers upon the earth, without having taken notice of, or made any allowance for, theſe *Under-currents* and *In-draughts*, which muſt neceſſarily carry off a great quantity of the water. I have already had occaſion to examine this opinion at large (page 176, *&c.*) and have ſhewn the falſity of it from facts and experiments; and this article may be brought as another argument againſt it.

IV. A *fourth* Proof of a *ſubterranean Reſervoir of water* may be deduced from *Lakes*.

Of theſe there are ſeveral ſorts, each tending to prove the point in queſtion; as, *firſt*, Thoſe which receive a great quantity of water, either from rivers or other means, but externally emit none; *ſecondly*, Thoſe that ſend forth a great quantity of water, but outwardly receive none; *thirdly*, Thoſe that neither increaſe nor decreaſe, notwithſtanding the difference of ſeaſons, or the quantity of water carried off by evaporation. In each of theſe caſes there muſt be a *ſubterraneous exit*, or elſe an *internal ſupply*; and when it has been proved, that there are ſome of theſe Lakes in almoſt every part of the world, it muſt be

be allowed, that the reſervoir which ſupplies them muſt be equally extenſive with themſelves, or that there is a collection of water which extends under the whole ſurface of the earth.

Of the *firſt* ſort of Lakes are the following, reckoned up by *Varenius*, (*Syſtem of Geog.* p. 280.) "In the foregoing propoſition we obſerved that the Lake *Titicaca* diſcharges a river into a ſmaller called *Paria*, which therefore may be referred to this claſs, *viz.* to ſuch as receive rivers but emit none. The lake *Aſphaltites*, which is alſo called the *Dead Sea*, receives the river *Jordan*, but emits none: its length, from north to ſouth, is ſeventy *German* miles, and its breadth five, as ſome make it. There is one in the Leſſer *Aſia*. There is a ſmall one in *Macedonia*, called *Jana*, which receives two little rivers. One in *Perſia* near *Calgiſtan*. The lake *Soran*, in *Muſcovy*, receives two ſmall rivers. The river *Ghir*, in *Africa*, is reported by *Leo Africanus* to loſe itſelf in a lake, and ſome maps ſo repreſent it, but others join it to *Nubia*." *Peter Martyr*, in his *Hiſtory of the Weſt-Indies*, p. 135, ſpeaking of *Hiſpaniola*, ſays, "That about threeſcore miles diſtant from the chief city of St. *Dominick*, there are certain high mountains, upon the tops whereof is a Lake or ſtanding Pool of freſh water three miles in compaſs, and well repleniſhed with divers kinds of fiſhes. Many ſmall rivers and brooks fall into it. It hath no paſſage out, but is on every ſide incloſed with the tops of mountains." Under this head we may reckon a Lake mentioned by *Du Halde*, in his *Deſcription of the Empire of China*,

Vol. I. p. 20. " This vaſt Lake [named *Tong-ting-Hu*, in the province of *Hu-quang*] is remarkable for the greatneſs of its circumference, which is above eighty *French* leagues, and the abundance of its waters, eſpecially in certain ſeaſons, when two of the largeſt rivers in the province, ſwelled with the rains, diſcharge themſelves into it, and when it diſembogues them, one can ſcarce perceive it to be diminiſhed." To this article alſo may be referred what has been already ſaid concerning the two leſſer ſeas or lakes, called the *Caſpian*, one in *Aſia*, the other in *America*, p. 222, 223.

Of the *ſecond* ſort of Lakes, or, *thoſe which ſend forth a great quantity of water but outwardly receive none*, take the following account from *Varenius* (*Syſtem of Geog.* p. 278). " There is an infinite number of theſe Lakes, and moſt large rivers flow from ſuch, as out of ciſterns;—of the ſmaller ſort are the following, the Lake *Wolga*, at the head of the river *Wolga*; the *Odoium*, at the head of the *Tanais*; the *Adac*, from whence one of the branches of the river *Tigris* flows; the *Ozero* [or *White* Lake] in *Muſcovy*, that gives ſource to the river *Shackſna*, which is poured into the *Wolga*, and many more little ones; we ſhall here only reckon ſome of the larger ſort that are more remarkable. The great lake *Chaamay*, in the latitude of twenty-ſix degrees north, not far from *India*, to the eaſtward of the river *Ganges*; out of this lake flow four very large rivers, which water and fertilize the countries of *Siam*, *Pegu*, &c. viz. the *Menaw*, the *Aſa*, the *Caipoumo*, and the

the *Laquia*. Some maps exhibit a ſmall river that runs into this lake. The lake *Singhay*, upon the eaſt border of *China*, ſends out a great river ſouthward, which, being joined to another, enters *China*. The lake *Titicaca*, in [*Los Charcas*] a province in ſouth *America*, is eighty leagues in circuit, and emits a large river, which is terminated in another ſmall lake, and is no more ſeen. There are ſeveral towns and villages diſcovered about this lake. The lake *Nicaragua*, in a province of the ſame name, in *America*, is only fourteen *German* miles from the *Pacific*, or South Sea, and above one hundred from the *Atlantic*, into which it is diſcharged at broad flood-gates. The lake *Frontena*, in *Canada*, out of which iſſues the river of *St. Lawrence*. The lake *Annibi*, in *Aſia*, in the latitude of ſixty-one degrees." And after, p. 282, where the Author gives an account of *Lakes* that *both receive and emit rivers*, it is evident that the quantity of water emitted by ſome is far ſuperior to what is received; and in others the quantity received ſuperior to what is emitted; ſo that there muſt be ſubterraneous ſupplies and exits.

THE next quotation I ſhall cite may ſerve both for this *ſecond article* and alſo for the *laſt*, *viz.* for thoſe *Lakes that neither increaſe nor decreaſe, notwithſtanding the difference of ſeaſons and the quantity of water carried off by evaporation*: it is from *Acoſta's Hiſtory of the Indies*, Book iii. chap. 16. " It is a queſtion often aſked, Why there are ſo *many Lakes* in the tops of theſe mountains, into which no river enters, but contrarywiſe many

great ſtreams iſſue forth, and yet do we ſcarce ſee theſe lakes to diminiſh any thing, at any ſeaſon of the year. To imagine theſe lakes grow by the ſnow that melts, or rain from heaven, that doth not wholly ſatisfy me; for there are many that have not this abundance of ſnow, nor rain, and yet we ſee no decreaſe in them: which makes me to believe they are ſprings which riſe there naturally; although it be not againſt reaſon to think that the ſnow and rain help ſomewhat in ſome ſeaſons. Theſe Lakes are *ſo common* in the *higheſt tops* of the *mountains*, that you ſhall hardly find any famous river that takes not its beginning from one of them. Their water is clear, and breeds little ſtore of fiſh, and that little is very ſmall, by reaſon of the cold which is there continually. Notwithſtanding, ſome of theſe lakes be very hot, which is another wonder. At the end of the valley of *Tarapaya* near to *Potozi*, there is a lake in form round, which ſeems to have been made by a compaſs, whoſe water is extreamly hot, and yet the land is very cold: they are accuſtomed to bathe themſelves near the bank, for elſe they cannot endure the heat being farther in. In the midſt of this lake there is a boiling of above twenty feet ſquare, which is the very ſpring, and yet (notwithſtanding the greatneſs of this ſpring) it is never ſeen to increaſe in any ſort: it ſeems that it exhales of itſelf, or that it hath ſome hidden or unknown iſſue: neither do they ſee it decreaſe, which is another wonder, although they have drawn from it a great ſtream, to make certain Engines for metal, conſidering the great quantity

quantity of water that iſſueth forth, by reaſon whereof it ſhould decreaſe." But the greateſt Lake of this kind in *America*, and indeed in the whole world, is the Lake *Parime*, lying directly under the Equator. " It is (as *Varenius* ſays in his *Syſt. Geog.* p. 278) in length from eaſt to weſt, about an hundred and five *German*, miles, and in the broadeſt place an hundred miles over or thereabouts; ſo that it may be compared with, if it do not exceed, any lake in the world for magnitude; yet it neither receives nor emits any rivers." *Gordon* in his *Geographical Grammar*, ſpeaking of *Scotland*, writeth thus, page 204, " Towards the north-weſt part of *Murray* is the famous *Lough-Neſs*, which never freezeth; but retaineth its natural heat, even in the extreameſt cold of winter; and in many places this lake hath been ſounded with a line of five hundred fathoms, but no bottom found. Nigh to *Lough-Neſs* is a large round Mountain [called *Meal-fuor-vouny*] about two miles of perpendicular height from the ſurface of the *Neſs*; upon the very top of which mountain is a lake of cold freſh water, often ſounded with lines of many fathoms, but never could they reach the bottom. This lake, having no viſible current running either to it or from it, is equally full all ſeaſons of the year; and it never freezeth." Sir *Robert Sibbald* in his *Scotia Illuſtrata*, p. 22, ſays, " That there are *various Lakes* in *Scotland*, eſpecially in the *higheſt places*, which neither emit nor receive rivers, and yet are full of water;" and concludes " that ſuch muſt be ſupplied by ſources from beneath, at leaſt with a quantity of water equivalent

lent to what is carried off by the heat of the Sun."

In *Kircher*'s *Mundus Subterraneus*, Lib. v. ch. 4. there is an account of ſeveral other *Lakes* of *each* of the above-mentioned kinds, and full proof that they derive their origin from and are continued by *ſubterranean ſources*. And though probably ſome of theſe Lakes are maintained by rivers that run under-ground, or by ſprings that iſſue out at their bottoms, yet, as we have already ſhewn (p. 194, &c.) that the *Springs and Rivers which appear above ground* owe their ſupplies to an *internal Reſervoir*, it muſt much more ſtrongly follow that theſe covert Springs and Rivers are owing to the ſame, and therefore that the Lakes, which are ſupported by them, plainly ſhew that there muſt be a *ſubterranean Reſervoir of water*.

V. A *fifth* Argument in proof of *an Abyſs of water beneath the earth* may be drawn from the conſideration of ſome *phænomena* attending *Earthquakes*.

An account of which I ſhall tranſcribe from Dr. *Woodward*'s *Nat. Hiſtory of the Earth*; the truth of which every perſon that is at all converſant in the hiſtory of Earthquakes cannot but know; and indeed the effects of the late dreadful ſhock of the earth at *Liſbon*, which extended themſelves (through means of the agitation of the waters of the Sea and the Abyſs) to the *four quarters of the world*,[u] being at preſent freſh in the

[u] See an Account of theſe effects, and how extenſive they were, in *Phil. Tranſ.* for the year 1756, Vol. XLIX. Part i. §. 2.

the memory of almoſt all now living, will bear ample teſtimony to the truth of what the Doctor aſſerts, *Nat. Hiſt.* p. 133, " That this *ſubterranean Heat* or Fire, which thus elevates the water out of the *Abyſs*, being in any part of the earth *ſtopped*, and ſo diverted from its ordinary courſe, by ſome accidental glut or obſtruction in the pores or paſſages through which it uſed to aſcend to the ſurface; and being by that means preternaturally aſſembled, in greater quantity than uſual, into one place, it cauſeth a great rarefaction and intumeſcenſe of the water of the Abyſs, putting it into very great commotions and diſorders; and at the ſame time making the like effort upon the *Earth*, which is expanded upon the face of the Abyſs, it occaſions that agitation and concuſſion of it which we call an *Earthquake*.

" THAT this *effort* is in ſome earthquakes ſo *vehement* that it ſplits and tears the *Earth*, making cracks or *chaſms* in it ſome miles in length, which open at the inſtants of the ſhocks, and cloſe again in the intervals betwixt them: nay, it is ſometimes ſo extreamly violent, that it plainly *forces* the ſuperincumbent *Strata*; breaks them all throughout, and thereby perfectly undermines and ruins the foundations of them; ſo that theſe failing, *the whole Tract*, as ſoon as ever the ſhock is over, ſinks down to rights into the Abyſs underneath, and is ſwallowed up by it, the water thereof immediately riſing up, and forming a lake in the place where the ſaid tract before was. That ſeveral conſiderable tracts of land, and ſome with cities and towns ſtanding upon them; as alſo whole

whole mountains, many of them very large and of a great height, have been thus totally *ſwallowed up.*

" THAT this effort being made in *all directions* indifferently, upwards, downwards, and on every ſide, the fire dilating and expanding on all hands, and endeavouring, proportionably to the quantity and ſtrength of it, to get room, and make its way through all obſtacles, falls as foul upon the *water of the Abyſs* beneath as upon the earth above, *forcing it forth* which way ſoever it can find vent or paſſage; as well through its ordinary exits, wells, ſprings, and the outlets of rivers, as through the chaſms then newly opened; through the *Camini* or ſpiracles of *Ætna*, or other near *Volcanoes*, and thoſe *Hiatus*'s at the bottom of the ſea, whereby the Abyſs below opens into it and communicates with it.

" THAT as the water reſident in the Abyſs is, in *all parts* of it, ſtored with a conſiderable quantity of heat, and more eſpecially in *thoſe* where theſe extraordinary aggregations of this fire happen, ſo likewiſe is the water which is thus forced out of it; inſomuch, that when thrown forth, and mixed with the waters of wells, of ſprings, of rivers, and the ſea, it renders them very ſenſibly hot.

" THAT it is uſually expelled forth in *vaſt quantities* and with *great impetuoſity*, inſomuch that it hath been ſeen to ſpout up out of the deep wells, and fly forth, at the tops of them, upon the face of the ground. With like rapidity comes it out of the ſources of rivers, filling them ſo of a ſudden as to make them run over their banks, and

overflow

overflow the neighbouring territories, without ſo much as one drop of rain falling into them, or any other concurrent water to riſe and augment them. That it ſpues out of the chaſms opened by the Earthquake in great abundance; mounting up, in *mighty ſtreams* to an incredible *height* in the air, and this often-times at many miles diſtance from any ſea. That it likewiſe flows forth of the *Volcanoes* in *vaſt floods*, and with wonderful *violence*. That it is forced through the *Hiatus*'s at the bottom of the *ſea* with ſuch vehemence, that it puts the ſea immediately into the moſt horrible diſorder and perturbation imaginable, even when there is not the leaſt breath of wind ſtirring, but all, 'till then, calm and ſtill; making it rage and roar with a moſt hideous and amazing noiſe; raiſing its ſurface into prodigious waves, and toſſing and rolling them about in a very ſtrange and furious manner; overſetting ſhips in the harbours, and ſinking them to the bottom; with many other like outrages. That it is refunded out of theſe *Hiatus*'s in ſuch *quantity* alſo, that it makes a vaſt addition to the water of the ſea; raiſing it many fathoms higher than ever it flows in the higheſt tides, ſo as to pour it forth far beyond its uſual bounds, and make it overwhelm the adjacent country; by this means ruining and deſtroying towns and cities; drowning both men and cattle; breaking the cables of ſhips, driving them from their anchors, bearing them along with the inundation ſeveral miles up into the country, and there running them aground;

ſtranding

ſtranding whales likewiſe, and other great fiſhes, and leaving them, at its return, upon dry-land."

AND again, *Nat. Hiſt. of the Earth Illuſt.* p. 104. " Now ſince there are, on record, earthquakes, and indeed not a few, by which the globe, for *many hundred miles* together, has been ſhaken at the *very ſame moment* of time, it thence follows, that the waters, which cauſed thoſe concuſſions, were not only equal in extent to that ſpace of the Globe which was ſo ſhook, but *one fluid body continued*, and not divided into parts or diſtinguiſhed into regions, ſo that particular portions thereof ſhould be confined each to its proper cavern. Nay, there want not inſtances of ſuch an *univerſal concuſſion of the whole Globe*,[w] as muſt needs imply an agitation of the whole abyſs. For an effect of ſo vaſt an extent could never have proceeded but from a cauſe equally extenſive, ſuch as might affect the whole earth at once; which cannot be done without ſuch an orb of water as I have deſcribed. We have had accounts from writers of the moſt unqueſtioned fidelity, and even from eye-witneſſes, that there have been earthquakes, in our own times, wherein the motion, given to the earth at the ſeveral ſhocks, perfectly reſembled that of the waves of the ſea raiſed by a ſtrong wind. Whoever ſhall rightly attend to this phœnomenon in particular, he muſt, not only acknowledge that the earth contains in it an abyſs of water, and is moved by the ſame; but muſt alſo readily agree with me that this terreſtrial part of the globe is nothing but a *thin ſhell*,

[w] See RAY's *Phyſico-Theological Diſcourſes*, p. 13.

ſhell, which includes in it, cloſely on every ſide, an *immenſe maſs of waters*, and whenever thoſe waters happen to be put into any extraordinary motion, the earth is by them moved and agitated juſt in the ſame manner as the incloſed waters are moved and agitated."

VI. That there is an *Abyſs of waters beneath the earth*, may be ſtill farther ſhewn *from the quantity of water that has been diſcovered in the inſide of the earth, in opening the ſtrata either for Stone, Coal,* &c. *in digging for wells,* &c. *in ſearching after minerals, ores,* &c. *from ſudden and accidental eruptions of water out of the bowels of the earth*; or *from diſcoveries of ſubterranean waters that have been made by any other means, either accidental or deſigned*, that do not properly come under the heads I have already diſcuſſed.

Mr. Hutchinson in his *Obſervations* on the earth (ſee Vol. XII. of his works, p. 331.) ſays, "It is hardly credible how great a quantity of water will be ſometimes flung upon miners, when they come to break up ſtrata of ſtone that have in them many of theſe cracks, that are ſo ſmall that they are hardly diſcernible. Theſe are indeed the natural conveyances of water; and, when once they are opened, it runs inceſſantly. I have obſerved ſuch an irruption of water in vaſt quantity out of Stone, that, exempting thoſe cracks, is much too denſe and cloſe to let any, the leaſt, humidity paſs."

The vaſt profuſion of water that ſometimes enſues the breaking up of the ſtrata in *Coal-pits* is

is well known to all that are in the leaſt converſant in that affair; and what amazing quantities are drawn off from deep *mines*, either by drains or levels, or raiſed by engines, is alſo well known: nay, in digging common wells and ponds, in places where there are no Springs above ground, it frequently happens, that ſuch a glut of water iſſues forth as to endanger the lives of the workmen. Of this Dr. *Shaw* gives us a remarkable inſtance in his *Travels*, p. 135, " The Villages of *Wadreagg* [in the eaſtern province of *Barbary*] are built in a plain, without any river running by them, and are ſupplied in a particular manner with water. They have, properly ſpeaking, neither fountains nor rivulets; but by digging wells to the depth of an *hundred* and ſometimes *two hundred fathom*, the inhabitants never fail of obtaining a plentiful ſtream. And to this purpoſe, they dig through different layers of ſand and gravel, 'till they come to a fleaky kind of ſtone, like unto Slate, which is known to lie immediately above *The* [*Bahar tâht el Erd*] *Sea below ground*, as they ſeem to call the *Abyſs*. This is eaſily broken through; and the flux of water which followeth the ſtroke riſeth generally ſo ſuddenly and in ſuch abundance, that the perſon let down to perform the operation hath ſometimes been overtaken and ſuffocated by it, though raiſed up with the greateſt dexterity."

Of *ſudden Eruptions of water* from out of the bowels of the earth there are ſeveral accounts recorded in hiſtory, ſome that have overflowed whole countries, others large towns and cities,

others

others villages: of theſe the reader may ſee ſeveral accounts in *Kircher*'s *Mundus Subterraneus*; *Ehrartus de Belemnitis Suevicis*, *Præfamen*; *Phil. Tranſ.* &c. I ſhall cite one account from the laſt mentioned Treatiſe, in order to give the reader an idea of ſuch Eruptions, N° I. p. 9. " In the beginning of *July* 1678, after ſome gentle rainy days, which had not ſwelled the waters of the *Garonne* more than uſual, one night this river ſwelled all at once ſo mightily that all the bridges and mills above *Toloufe* were carried away by it. In the plains which were below this town, the inhabitants, who had built in places which by long experience they had found ſafe enough from any former inundations, were by this ſurprized; ſome were drowned together with their cattle; others had not ſaved themſelves but by climbing of trees, and getting to the tops of houſes; and ſome others who were looking after their cattle in the field, warned by the noiſe which this horrible and furious torrent of water (rolling towards them with a ſwiftneſs like that of the ſea) [in *Britaigne* he means] made at a diſtance, could not eſcape without being overtaken, though they fled with much precipitation: this nevertheleſs did not laſt many hours with this violence. At the ſame time exactly, the two rivers only of *Adour* and *Gaue*, which fall from the *Pyrenean* hills, as well as the *Garonne* and ſome other little rivers of *Gaſcoyne*, which have their ſource in the plain, as the *Gimone*, the *Saue*, and the *Rat*, overflowed after the ſame manner, and cauſed the ſame devaſtations. But this accident happened

not at all to the *Aude*, the *Ariege*, or the *Ariſe*, which come from the mountains of *Foix*, only that they had more of the ſame than thoſe of the *Conſerunt*, the *Comminge*, and the *Bigorre*. M. *Martell* (by the order of M. *Foucault*) hath ſearched after the cauſe of this deluge, being aſſured that it muſt have had one very extraordinary: for all who had ſeen the circumſtances agreed, that it had *rained* indeed, but that the rain was neither *ſo great*, nor laſted *ſo long*, as to ſwell the rivers to that *exceſs*, or to melt the ſnows of the mountains. But the nature of theſe waters, and the manner of their flowing from the mountains, confirmed him perfectly in his ſentiments. For, 1. the inhabitants of the lower *Pyreneans* obſerved, that the water flowed with violence from the *entrails* of the mountains, about which there were opened ſeveral channels which, forming ſo many furious torrents, tore up the trees, the earth, and great rocks, in ſuch narrow places where they found not a paſſage large enough. The water alſo which *ſpouted* from all the ſides of the mountain in *innumerable Jets*, which laſted all the time of the greateſt overflowing, had the *taſte* of *Minerals*. 2. In ſome of the paſſages the waters were *ſtinking* (as when one ſtirs the mud at the bottom of the mineral water) in ſuch ſort that the cattle refuſed to drink of it, which was more particularly taken notice of at *Lombez*, in the overflowing of the *Saue* (which is one of the rivers) where the horſes were eight hours thirſty before they would endure to drink it. 3. The Biſhop of *Lombez* having

having a desire to cleanse his gardens, which the *Saue*, passing through by many channels, by this overflowing, had filled with sand and mud; those which entered them felt an *Itching*, like to that which one feels when one bathes in *Salt-water*, or washes oneself with some strong Lixivial. This Itching could not be produced by either rain or snow water, but by *some mineral Juice*, either *Vitriolic* or *Aluminous*, which the waters had dissolved in *the bowels of the mountains*, and had carried along with it in passing out through those numerous crannies. For these reasons M. *Martell* believes the true cause of this Overflowing to be nothing else but *subterraneous Waters*."

I MIGHT here add an account of the *Rivers* that are known to run wholly under-ground, and even of the *Cataracts* that have been discovered there (of which *Herbinius* in his *Dissertationes de admirandis Mundi Cataractis, supra & subterraneis*, &c. gives a description) but to avoid prolixity shall conclude with observing, that *the deeper we penetrate into the earth, the greater quantity of water is met with, and that generally this water breaks forth in such a manner* as manifestly to shew that it is *raised by a power from underneath*, thereby plainly indicating its *subterranean origin*.

THUS I have produced several arguments to prove that there is an *Abyss of water beneath the earth*; and several others might be brought; but these may more naturally be introduced under some of the subsequent heads. For I would observe here, once for all, that there is such a close connection between the several parts of the

ſubject I am treating of, or the Heads I have been obliged to divide it into, that very often one and the ſame argument (or at leaſt with the help of a few additional ſentences) will prove two or three of theſe Heads, but yet is more immediately applicable to one; I ſhall therefore diſpoſe of it under its proper Head, and as far as it affords proof for other particulars, deduce them by way of *corollaries* or *concluſions*.

But before I quite finiſh the Article I am now upon, it may not be amiſs to endeavour to ſhew what the *Form* and what the *Size* of this Abyſs may be.

From what has been already ſaid (p. 212.) it appears that the Abyſs and the Ocean are in conjunction with each other, and therefore that the Abyſs is not divided into ſeparate parts or diſtinguiſhed into large detached caverns (as ſome have imagined) but is *one continued* and *united body of water*, and equal in extent to the circumference of the lower part of the ſhell of the earth, and lying immediately under it; as is alſo evident from what is ſaid page 238. And therefore as the *Shell of the earth* is of a *round form*, we may juſtly eſteem the *Abyſs* to be ſo likewiſe, as it is repreſented in *Plate* the *Second* by G. H.

And that the Abyſs is really of *this form* we have better proof than any that can be deduced from natural evidence, for He who made it and the whole earth hath aſſured us that it is ſo, as I have ſhewn p. 43, 44; and in order to ſtrengthen the comments there made upon Scripture, and to add authority to the juſtneſs of them, I ſhall cite the

the opinion of the celebrated *Stackhouſe* in his *Hiſtory of the Bible*, p. 125. I ſelect this writer (out of ſeveral that might be brought) not only becauſe he has determined the *Form* of the Abyſs, but has ſpoken of the *Size* of it, and given a calculation by which the reader may judge of the quantity of water contained therein. "It is certainly (ſays he) more than probable (becauſe a matter of divine Revelation) that there is an immenſe body of water encloſed in the earth, to which the *Pſalmiſt* plainly alludes when he tells us, that (*Pſal.* xxiv. 2.) *God founded the earth upon the ſeas*, and *eſtabliſhed it on the floods*; that (*Pſal.* cxxxvi. 6.) *he ſtretched out the earth above the waters*; that (*Pſal.* xxxiii. 7.) *he gathered up the waters as in a Bag* (ſo the beſt tranſlations have it) *and laid up the Deep as in a Storehouſe.* Nay, there is a paſſage or two in the Proverbs of *Solomon* (where *Wiſdom* declares her Antiquity, and pre-exiſtence to all the works of the earth) which ſets before our eyes, as it were, the *very Form* and *Figure* of this *Abyſs*; (*Prov.* viii. 27, 28.) *When he prepared the heavens, I was there, when he ſet a Compaſs upon the face of the Deep, and ſtrengthened the Fountains of the Abyſs.* Here is mention made of the *Abyſs* and of the *Fountains of the Abyſs*; nor is there any queſtion to be made, but that the Fountains of the Abyſs here are the ſame with thoſe which *Moſes* mentions, and which, as he tells us, *were broken up at the Deluge.* And what is more obſervable in this Text, the word, which we render *Compaſs*, properly ſignifies a *Circle* or *Circumference*, or an *Orb*, or *Sphere*: ſo that ac-

cording to the teſtimony of *Wiſdom*, who was then preſent, there was in the beginning a *Sphere*, *Orb*, or *Arch*, ſet round the Abyſs, by the means of which, the *fountains* thereof were *ſtrengthened*; for we cannot conceive, how they could have been *ſtrengthened* any other way, than by having a *ſtrong Cover* or *Arch made over them*. If ſuch then be the form of this Abyſs, that it ſeems to be a vaſt maſs or body of water, lying together in the womb of the earth, it will be no hard matter to compute what a plentiful ſupply might have been expected from thence, in order to effect an *univerſal Deluge*. For if the Circumference of the earth (according to the loweſt computation) be twenty-one thouſand miles, the diameter of it (according to that circumference) ſeven thouſand miles, and conſequently from the ſuperficies to the center, three thouſand five hundred miles; and if (according to the beſt account) the higheſt mountain in the world (taking its altitude from the plain it ſtands upon) does not exceed *four perpendicular miles* in height; then we cannot but conclude, that in this Abyſs there would be infinitely more water than enough, when drawn out upon the ſurface of the earth, to drown the earth, to a far greater height than *Moſes* relates."

II.

I AM now to prove *that the whole Earth was covered to an immenſe height by this Subterranean Water*, or *that the Deluge, in the time of* Noah, *was univerſal*; *the Fountains of the Great Abyſs having been broken up, and the water thereof elevated above all the high Hills under the whole heaven.*

AND, *firſt*, to begin with proofs deducible from the circumſtances of *things on* or *near the Surface of the Earth.*

I. THE Diviſion of the ſurface of the earth into Mountains, Hills, Combs, Dales, Vallies, *&c.* is ſo obvious and ſtriking, that few or none but muſt have obſerved it; though probably but few have ſeen how far this regularly irregular Diviſion (as I may juſtly call it) was owing to and is a proof of an univerſal Flood, or that the ſurface of the earth has been covered to a great height by an inundation of water. I ſhall therefore enlarge on this article, and point out the evidence deducible therefrom.

Mountains and *Hills* have generally on all ſides a regular deſcent or inclination from their tops, greater or leſs, longer or ſhorter. And when ſeparately conſidered, and without attending to every little inequality, may be ſaid to be of a *conical* or *pyramidal* ſhape; and when many lie cloſe together, or are continued in a direct chain through whole countries, they may be ſaid to be of a *priſmatical* form.

THE point therefore to be decided is, *Whether this be their original ſhape*, that which was neceſſarily produced by, and in which they have always remained ſince, the firſt ſituation of their materials in the places they now ſtand?—Or, *Did they obtain their preſent form afterwards*, *i. e.* were their original materials modelled, framed, or brought into this ſhape by the action of ſome outward Cauſe?—And *what was that Cauſe?*

THAT Mountains were not originally of this ſhape ſeems evident from the manner in which their materials or conſtituent parts ſubſided and at preſent lie, they being diſpoſed in ſtrata, beds, or layers (whether of ſtone, clay, chalk, *&c.*) of equal thickneſs throughout, and regularly lying upon each other in a flat, level, or horizontal poſition; which ſituation of all others ſeems the leaſt proper for diſpoſing ſuch materials into a conical or priſmatical figure. Did their ſtrata or layers ſtand one againſt another in a ſloping poſture like the ridge of a houſe, or even perpendicularly upright, it might more probably have indicated their preſent ſhape to have been the original; but ſince they are poſited in a flat, level ſituation, (which is the moſt different from any of the *upright* forms) it ſeems plainly to ſhew that their preſent ſhapes were not the original, but are owing to ſome *external force*.*

WHICH is farther evident from hence, that in mountainous countries, which conſiſt of the ſame kind of ſtrata, the ſtrata in each mountain ſhall exactly anſwer or correſpond together in every

* See Note [x] in page 153.

every reſpect—in ſpecies, in colour, in depth, in thickneſs, in ſituation, and in their contents. So that ſuppoſe the firſt [under the vegetable mould] or uppermoſt ſtratum to be of a whitiſh coloured Sand-ſtone, one yard thick; the ſecond a red Marl, two yards; the third a blue Lime-ſtone, containing ſhells, teeth, bones, *&c.* of particular kinds, one yard thick; the fourth a blue Clay, containing native foſſils, ſuch as ſelenitiæ, pyritæ, *&c.* three yards thick; the fifth a grey Flag-ſtone, eight yards thick; the ſixth a ſtratum of Coal, [with its uſual attendant, a black clayey ſlate, replete with plants of all ſorts] two yards thick; the ſeventh a Rag-ſtone, ten yards thick; the eighth a Free-ſtone, containing a great variety of ſhells, twelve yards thick; the ninth a red Sand-ſtone, ſixteen yards thick; the tenth a ſtratum of grey Lime-ſtone, containing a great variety of corals, ſhells, *&c.* reaching to the bottom of the mountain.[x] Now in the ſame order and

[x] If any perſon ſhould be deſirous of examining the ſtrata of the earth in a mountainous country, and ſhould not find any great variety of ſtrata, or even but one ſingle ſtratum, yet upon ſtrict inſpection, or rather at firſt ſight, he will perceive that this ſingle ſtratum is divided into a great number of leſſer ſtrata or ſmall layers, which will be eaſily diſtinguiſhable from each other, either by their colour, depth, thickneſs, or more remarkably by their contents, or the foſſil bodies they contain, one layer abounding with one ſpecies of ſhells, another with a different; another layer containing bones and teeth of fiſhes; another corals of various kinds, *&c. &c. &c.* ſo as to afford him evident marks by which he may diſtinguiſh one layer from another, almoſt as readily as if there had been ſtrata of different ſubſtances.

In the deſcription of the above ſuppoſed Mountain the Strata are not repreſented *as lying according to their ſpecifick Gravities*, for however commonly received the opinion is that they do ſo lie, yet I never

and in the ſame horizontal poſition you ſhall find ſimilar ſtrata in each mountain throughout ſuch a country.—The queſtion therefore is, whether they were not *all* once *united*, or the ſtrata continued throughout in one entire body, without any of thoſe *Eminences* we call Mountains, or thoſe *Hollows* called Vallies? And if ſo, then the *preſent mountainous form* was not the *original*, or theſe mountains were not coeval with, or any ways owing to, the diſpoſition of their materials or the ſettlement of their ſtrata.

Now in order to ſhew that the ſtrata in theſe mountains were once *wholly continued*, let a perſon firſt examine a ſingle *chain* or *ridge* of them, running for ten, twenty, or thirty miles only, [and they ſometimes continue for ſeveral hundred] in which chain particular mountains are diſtinguiſhable from each other only by the ſeparation or vacant ſpaces between their tops, reaching to different depths and at various diſtances; and ſuppoſe, upon examination, he ſhould find that the ſtrata in each of the tops were of the ſame kind, colour, thickneſs, *&c.* (as above deſcribed) and lying in the ſame poſition, and only parted from each other by the vacant ſpaces between their ſummits, and that the *ſtrata underneath*,

I never could find them in this ſituation in any place that I have ſeen. And the ſeveral experiments and obſervations that have been made upon the ſtrata of the earth, when opened to the *greateſt depths*, ſhew that they do not lie according to their ſpecifick gravities; ſee in particular *Philoſoph. Tranſ.* N°. 336, *Art.* xi. N°. 250, *Art.* ii. N°. 360, *Art.* iv. N°. 391, *Art.* i. VARENIUS's *Geography*, Lib. I. cap. vii. Propos. 7. HAUSKBEE's *Experiments*, p. 317, *Experim.* xx. LUIDII *Lythophil.* p. 110.

derneath, in the body of the mountain, were *quite whole and entire*, lying in the ſame direction or parallel with thoſe in the tops,—would he not conclude that the uppermoſt ſtrata were likewiſe once whole and united [which are now only diſcontinued by the comparatively ſmall vacant ſpaces between the ſummits of the mountains] as well as thoſe that are underneath? Eſpecially, if he were to remark that, where the ſeparation between the tops of ſome of the mountains was not ſo great or deep as in others, the ſtrata that did not appear in the reſt would appear in theſe; or ſuppoſe the depth of the ſpace between ſome of the mountains to be no more than thirty yards, or to reach down to the ſtratum of Free-ſtone (in the above deſcription) but that in other of the vacant ſpaces between the mountains even this ſtratum of Free-ſtone ſhould not be found, or, as is frequently the caſe, only a part or half of it be wanting,—would he not conclude, that the other part was formerly ſubſiſting in its due place and order? And if he would judge thus of this ſtratum, doubtleſs he would determine the ſame of the reſt, and that the vacant ſpaces between the tops of the mountains throughout this chain were formerly filled up with their reſpective ſtrata.

JUDGING then thus of this ſingle Ridge of mountains, let him now extend his view on every ſide, and behold how exactly parallel the ſame kind of ſtrata in the adjacent mountains lie with their ſimilar ones in this chain, and he will as readily conclude that they were all once in conjunction

junction and the vallies between them filled up with correſponding ſtrata, as thoſe vacant ſpaces were between the tops of the firſt chain of mountains he examined.—In ſhort, if a perſon was to ſee the broken walls of a palace or caſtle that had been in part demoliſhed, he would certainly conclude that the breaches or vacant ſpaces in thoſe walls were once filled up with ſimilar ſubſtances, and in conjunction with the reſt of the walls, and could eaſily with his eye ſee the lines in which the walls were carried, and in thought fill up the breaches and re-unite the whole: and in the ſame manner if a perſon was to view the naked ends or broken edges of the ſtrata in a mountain on one ſide of a valley, and compare them with their correſpondent ends in the mountain on the other ſide of the valley, he would manifeſtly perceive that the ſpace between each was once filled up, and the ſtrata continued from mountain to mountain. So that the preſent conical ſhape of mountains was not coeval with their ſubſtances or with their inward and original form; they being primarily of *no outward* form, if I may ſo ſay, or rather there were once none of thoſe Eminences upon the earth which we now call Mountains; for when the ſtrata of the earth were whole and entire, and in conjunction with one another, and the vacancies that now occaſion vallies, dales, *&c.* filled up with their reſpective ſtrata (which was during the height of the Deluge, before the waters began to retire) the Earth muſt have been of *one ſpherical form* without mountains, hills, dales, vales, *&c.* and all the ſtrata muſt have lain originally

ginally *horizontally* upon one another, or rather, to ſpeak philoſophically, *concentrically* with each other.

And what farther ſhews that mountains are only *Eminences* of the earth, cauſed by the excavation or ſcooping out of the ſubſtances or ſtrata that formerly occupied thoſe *Hollows* which we now call Vallies, Dales, Combs, *&c.* is this, that it may be demonſtrated, that the origin of mountains cannot be owing to any *Elevation* or *Depreſſion* of their ſtrata; though moſt writers have attributed it to this cauſe, and ſuppoſed them to have been produced by Diſruptions *from within the earth*, occaſioned by the breaking out of ſubterranean fires, earthquakes, *&c.* whereby the ſtrata became elevated in ſome places, and depreſſed in others: but this could not have been the caſe. For the ſtrata of Mountains in the inland countries (and ſuch *mediterranean Eminences* are properly to be termed *Mountains*, Hills being leſs, and ſituated at a diſtance from mountains, and nearer the ſea) are generally, and if the higheſt or moſt inland in the Continents or Iſlands on which they ſtand, are, I may venture to ſay, always poſited in an *horizontal* direction, or but very little inclining therefrom, and even this inclination accountable from other cauſes than Diſruptions, as will be ſeen in the proceſs of this treatiſe.[y] Now the ſtrata of Mountains being thus

[y] Thus much I can ſay for certain, that the *Strata* in ſome of the higheſt ridges of Mountains in *England* and *Wales* are *horizontally poſited*; which is a plain proof that Mountains in general might

thus horizontally placed, which alſo appearing to have been their original poſition, (as will more clearly be ſhewn hereafter) is an undeniable proof, that they have *not* been *diſplaced*, and therefore that theſe eminent parts of the earth were not owing to any *Elevations* or *Depreſſions* of their ſtrata; for had they been produced by either of theſe means, the ſtrata muſt have been inclined in various angles, and placed in the moſt different directions from the horizontal.

BESIDES, had Mountains been owing to the Elevation or Depreſſion of their ſtrata, the outſides and forms of Mountains would have been ſhaped

might have been, and that theſe in particular really were, formed without any elevation or depreſſion of the ſtrata: and hence alſo it appears that the *horizontal poſition* is the *original* and *natural ſituation* of the ſtrata. And in ſuch mountainous places where I have obſerved the ſtrata to be *ſomewhat inclined*, it has generally been where there are large and deep vallies, ſteep precipices, naked rocks for a great extent of ground, and many other ſuch like proofs that the Agent (the *water*, as will be ſeen hereafter) that tore out the hollows of the dales and vallies, paſſed off with great rapidity, and acted with great force upon the ſubjacent ſtrata; in doing which it would naturally (in ſuch places where there was a variety of ſtrata) waſh and carry away the more ſoft and brittle ſtrata, and by this means undermine, and ſo incline, the ſuperior beds of ſtone, *&c.* and in many places I have remarked, particularly upon the ſides of ſteep mountains, that this inclination of the ſtrata is but for the depth of ſome feet, or what I may call, *ſuperficial*; and that the beds of ſtone upon the top of the mountain are but little, or not all, inclined; and in the body of the mountain are *horizontally poſited:* which plainly ſhews, that the *upper ſtrata only* have been moved, and moved too by ſome *outward* cauſe, and not the *whole body of the mountain*, either by elevation or depreſſion of the ſtrata.

MARSILLI (who ſpent his whole life almoſt in making obſervations on the Earth) ſays, that the *general ſituation* of the *ſtrata* in the *mountains*, all over that part of *Europe* which he had travelled, was *horizontal* or *nearly ſo*. *Hiſtoire de la Mer*, p. 7.

ſhaped or in a great meaſure have anſwered the inward poſition of the ſtrata; whereas this is ſeldom the caſe; and in Mountains where the ſtrata are horizontal, never can be, provided thoſe Eminences are of the common pyramidal or conical ſhape; but where ſuch have large extenſive plains or much level ground upon their tops, the outward ſhapes of theſe indeed uſually anſwer or correſpond with the inward level ſite of the ſtrata; but ſuch *flat* eminences as theſe are not what we generally underſtand by the term *Mountains*, and ought rather to be called, as they commonly are, high *Plains* or *Downs*. And in ſuch mountains or rather *Hills* where the ſtrata are inclined, I have ſeen the outward form very different from what one might expect from the inward inclination of the ſtrata, nay, ſometimes *directly contrary* to it.

It being then thus certain, that the preſent outward form of Mountains was not owing to either the inward diſpoſition or preſent ſituation of the ſtrata, and that the vacant Spaces between the tops and ſides of mountains were once filled up, it muſt follow, That theſe high and eminent parts of the earth were cauſed by ſome external Agent, or Means, that acted upon the *outward ſurface* of the earth, and which, by *tearing off and carrying away* the *matter* or *ſtrata* that formerly occupied thoſe places we now call *vallies*, left thoſe *Eminences* ſtanding, which we now call *Mountains*.

And that this was really the caſe will yet more manifeſtly appear, in tracing out what that *Agent*

was

was that effected this, which is the next thing to be conſidered.

THAT the outward form of Mountains was owing to the action of ſome *Fluid*, which by ſoftening and mollifying the parts gradually wore and tore away the circumjacent ſtrata, is evident from the conical ſhape, regular ſlope, or gradual deſcent of Mountains from their tops quite down their ſides; and when we conſider the bulk of a mountain, and the prodigious number of them upon the earth, there is no Fluid of a nature proper, and in quantity ſufficient, for effecting this but *Water*.

AND that Water was the Agent is farther evident from the general tendency or declination of the ſides of mountains down towards the Sea, eſpecially in iſlands and peninſulas, chiefly and more remarkably in ſuch as are longer than they are broad; and in necks or promontories of land that jut out into the ſea, and have water on both ſides of them. So in the iſlands of *Cuba*, *Hiſpaniola*, *California*, *Madagaſcar*, *Sumatrá*, *Suconia*, St. *Chriſtopher*, and many others, there is a ridge or chain of mountains running directly through the middle, in a line with the length of thoſe iſlands and peninſulas, gradually leſſening with gentle declivities on each ſide, tending outward or falling away down towards the two ſeas [not inward towards the land], juſt in ſuch a manner as Water deſcending from the tops of theſe ridges would naturally have torn and carried away the ground, and ſo have formed regular deſcents on both ſides; which deſcents generally

continue

continue for ſeveral miles underneath the ſea; for it is a common obſervation with mariners, that where the ſhore lies nearly level or upon a gentle deſcent, that there the ſea gradually increaſes deeper and deeper the farther you proceed from land;[z] ſo as plainly to ſhew, that the ground underneath or the bottom of the ocean was formed after the ſame manner, and is only a continuation of that at Land: ſince then theſe Deſcents or Declivities are at preſent in part covered with *water*, there can be no reaſon to doubt that this was the Agent that formerly covered and formed the whole.

THUS alſo in *Promontories* or parts of land that project into the Sea, where ſuch are long and narrow, there is commonly a ridge or ſeveral ridges of mountains paſſing through the middle with gentle declivities on each ſide. Thus in *Italy* the *Apennine* mountains are continued lengthways through the middle of that country, and divide it in two parts, juſt in the manner (as it has been repreſented) as the back-bone of an animal does his body; ſimilar is the ſituation of the mountains in *Norway*, *Malacca*, *Corea*, *Cambodia*, *India* within the *Ganges*, the ſouth part of *Africa* for ſeveral hundred miles, and for as many in the ſouth part of *America*, &c. And what is farther remarkable in Promontories and ſuch procurrent parts of land, they generally, and eſpecially where there is an open and free Sea,

[z] *Acts* xxvii. 27, 28. KIRCHER's *Mundus Subterraneus*, p. 97. MARSILLI *de la Mer*, p. 11. RAY's *Three Phyſico-Theological Diſcourſes*, p. 27.

gradually leſſen and terminate in a point like a Wedge; which is exactly the form that water, retreating from the upper lands and falling on each ſide, would naturally ſhape and reduce it into.

WHEREAS the effects of the water, deſcending from the ſurface of ſuch extenſive parts of the earth as *large Continents* are, would exhibit a different appearance of things from what they do upon iſlands and promontories; for in this caſe the water would take many and various courſes, according to the greater number, diſtance, and irregular ſituation of the Paſſages or Inlets it had into the Abyſs (which inlets we may ſuppoſe to be in ſuch places where Seas and large Lakes are at preſent); and alſo according to the greater variety of the Strata it had to act upon (many of which ſtrata would reſiſt, and as many yield to, the force of the water; and ſome more, ſome leſs) ſo that under ſuch manifold and different circumſtances we might expect to find the *Chains* or *Ridges of Mountains* upon large Continents lying in *many* and *various directions*; and accordingly we ſo find them.

BUT yet, in ſome degree, the outward form or ſurface of *Continents* and *Iſlands* would reſemble each other; for upon both, and even where there were no remarkably great mountains, we might reaſonably imagine, that the inland parts would be the higheſt, or more eminent than the maritime; for the water would act more ſtrongly and tear off a greater quantity of the earth near the ſea-coaſts than higher up within the

the land; and this, for two reaſons;—becauſe the Paſſages into the Abyſs lay nearer the ſea-coaſts, and thither the whole force of the water was directed;—and becauſe all the water that covered the inland parts of the earth would flow over and act upon the maritime, and would bring along with it large fragments of rocks and a great quantity of rubbiſh, which by being driven upon, would wear and tear away, the land near the ſea-coaſts to a great degree; and therefore the *mediterranean parts* of *Iſlands* and *Continents* would be leſs, or but little, torn; and on this account, after the retreat of the water, be left ſtanding higheſt. And this alſo we find to be fact: as is evident from the courſes or falls of rivers; they generally, or indeed almoſt univerſally, taking their riſe in or near the *Middle* of Continents and Iſlands, and flowing down towards, at laſt empty themſelves into the Sea; and as it is certain that the fall of water is always from the higher to the lower grounds, ſo it is as certain that the inland parts of the earth are higher than the maritime.

Besides, it is a common obſervation, that mountains or inland Eminences are higher and their deſcents or ſides longer than thoſe of Hills; which are generally ſhorter, but their ſides or falls more ſudden and precipitous: and that the ſtrata in Mountains are horizontal, but in Hills (or leſſer Eminences nearer the ſea) are generally oblique or inclined. All which is exactly conſonant to what a Flood of water, retreating from the ſurface of the earth, would naturally produce; as is evident from what has been ſaid in

the above paragraph: and the truth of the fact may be exemplified from the manner in which water moves when permitted to run out at an orifice at the bottom of a large and deep veſſel; the chief action or motion of the water is at and near the orifice; while the ſurface is almoſt calm; and if the bottom of the veſſel be made of any matter that will yield to the force of water, it will be moſt torn at and near the orifice, ſince the current will be there ſtrongeſt: and ſo, as the water, that covered the earth, retreated from the ſurface towards the apertures in its ſhell, the chief motion and violence would be at the mouths of the orifices that led into the abyſs, whither the whole body of the water tended, and its whole force was exerted; and near theſe apertures the currents of water would be very ſtrong and rapid, and which, by waſhing away the more ſoft and brittle ſtrata, would undermine whole ridges of mountains and lay their ſtrata in a ſloping poſture, and by its continual action in paſſing over theſe ridges, would reduce and wear them leſs and leſs until they came to be of their preſent ſize or Hills. But higher up or at a greater diſtance from the ſea, the force would be proportionably diminiſhed, as the quantity of water would be leſs and the current weaker; ſo that the ſtrata in mountains are but little or not at all diſturbed from their original horizontal poſition; and as a leſs degree of force was exerted in forming them than in Hills, ſo their deſcents would of courſe be longer and more gradually declining than thoſe of Hills.

And

And from what has been juſt ſaid, we may ſee the propriety of Monſ. *Buache*'s plan of the diſpoſition of Mountains, as laid down and delineated in *Hiſtoire de L'Acad. des Scien. An.* 1752, *Nov.* 15. according to which, the greater or moſt remarkable Ridges of Mountains upon the ſeveral Continents of the earth take their riſe in or near the *middle* of large Tracts of land; and are ſtretched out, as radii, from ſome *high* and *extenſive Plains*; one of which plains riſes in *Africa*, another in *Aſia*, two ſmall ones in *Europe*, one in *North* and another in *South America*; and from each of theſe, reſpectively, iſſue out, like horizontal ſhoots from a ſtock, ſeveral long Ridges or Chains of Mountains.

In order to ſee the reaſon of this from Experiments, and how far it would favour our preſent hypotheſis, I provided a large veſſel of Glaſs, had ſeveral holes of different ſizes bored in the ſides about ſix inches from the bottom, and ſtopped each with cork: I then filled the veſſel with water; and having pulverized before-hand certain portions of the various ſtrata of which the earth conſiſts, as Stone, Coal, Clay, Chalk, *&c.* I permitted theſe ſubſtances to ſubſide one after another through the water, 'till the terreſtrial maſs reached about two inches above the level of the holes: and the whole ſettled in regular layers one upon another, juſt according to the diſpoſition of things in the earth. I then (with the aſſiſtance of another) pulled the corks out of each hole as nearly at the ſame time as poſſible. The water immediately began to drive the earthy parts through

the holes, and ſcooped or tore the ſurface of the earthy maſs in ſuch a manner as that the deepeſt Hollows were near the Apertures, *i. e.* where the force was greateſt, and the ſeveral furrows gradually leſs and leſs, towards the middle part; as the force of the water was proportionably diminiſhed to its diſtance from the place where its moſt violent action was: ſo that at the greateſt diſtance from the apertures, *i. e.* in the middle of the heap of the terreſtrial maſs there were no furrows at all, and that part remained the *higheſt* of all the reſt, and anſwered to one of the above-mentioned *high plains* upon the ſurface of the earth: and from this middle-part there tended ſeveral ridges, between the furrows leading down towards the holes in the veſſel, juſt in ſuch form as the chains of mountains, which take their riſe in or near the middle of ſome Continent upon the earth, and tend, like radii, from ſome high inland plain towards their reſpective apertures in the Seas next adjoining.—Beſides; the ſtrata in the middle-part of the terreſtrial maſs remained immoveable, and without the leaſt alteration, but thoſe near the apertures in the veſſel were bent and inclined, and in ſome parts confuſedly mixt together, agreeably to the diſpoſition of things in the earth, with reſpect to inland and maritime Eminences, as I have obſerved already.

THUS do the phænomena on the ſurface of the earth, with regard to *Mountains* and *Hills*, *higher* and *lower lands*, both upon *iſlands*, *peninſulas*, *promontories*, *and continents*, exactly anſwer to, and manifeſtly ſhew forth, *the effects of a Flood of Water*

Water which once covered the whole, and gradually retreated therefrom.

And this will be ſtill more evident if we deſcend to a particular examination of the form, ſituation, and cauſe of *Combs*, *Dales*, *Vallies*, &c. It was neceſſary to ſpeak ſomewhat of theſe before, but they deſerve a ſeparate and cloſer conſideration than could hitherto have been conveniently beſtowed upon them.

A *Comb*, a Glin, a Dingle, or a Gill, *&c.* (for it paſſes under different names in different parts of *England*) is a gradually increaſing or gently declining Hollow upon the ſurface of the earth, the ſides regularly ſloping down towards the middle part. They are of various ſizes; ſome being not more (or even leſs) than three or four hundred yards in length, fifty in breadth, and twenty in depth at their largeſt end; others there are that are three or four miles in length, a mile in breadth, and four or five hundred yards deep; and others of all intermediate ſizes. They generally begin at a ridge of mountains or hills, and tend down their ſides towards the lower lands; their beginnings or upper parts are very ſmall, in ſome places ſcarcely perceptible; and they gradually open or increaſe to ſome of the above-mentioned lengths, breadths, and depths. The ſtrata in moſt of them are bare and viſible, if not throughout the whole Comb, yet in ſome part or other, or rather in ſeveral parts; and the broken ends or edges of the rocks that project from each ſide generally anſwer each other to a ſurpriſing exactneſs; and near the beginning or in the upper parts of the Comb they

almoſt touch and meet each other, and at the very beginning are united; and ſo leave no doubt to conclude but that the ſtrata were once in contact, or continued in parallel lines from ſide to ſide throughout the whole Comb.[a] And this mutual agreement between the ſtrata on each ſide of Combs evidently ſhews, that theſe and ſuch like Cavities were cauſed by ſome outward Agent that acted upon the ſurface of the earth, and which, by tearing off and carrying away the interjacent ſtrata, left theſe Hollows, and were not owing to any inward diſruption, or a force from beneath: for had this latter been the caſe, it could not be but that the ſtrata on one ſide or other of Combs would always appear elevated or depreſſed, or ſome way or other altered. And it is farther demonſtrable that Combs and Gills were not owing to any inward diſruptions, ſince it is common to obſerve in ſuch of them as have rapid rivers

[a] Sometimes indeed the ſtrata on one ſide of a Comb are different both in kind and ſituation from thoſe on the other; but then the reaſon is evident upon the ſpot; as, firſt, either the Comb was formed in a place where the ends of different ſtrata met, or in a deep fiſſure, or two or three Combs happened to be formed near together, and by the ſide of each other, and then the Agent that tore the largeſt has ſhelved off, or inclined the ſtrata of the larger towards the leſſer, there being no ſtrata on the back-part (on account of the cavity of the leſſer Comb) to ſupport it; or ſome ſuch accident or other has made a difference, which will be at once manifeſt to a judicious ſpectator. And theſe accidents generally happen in hilly countries, or ſuch as are near the ſea, where the water of the deluge, in its retreat from the ſurface of the earth, deſcended with violence and acted with great force; whereas higher up in the inland countries, or near the mountains, the Combs and Gills are generally very regular and exact, and the broken edges of the ſtrata on each ſide tally and correſpond to the utmoſt nicety.

rivers or ſtrong currents of water running through them, that the ſtrata at their bottoms are whole and entire, and lie parallel with thoſe above; nay, when miners have occaſion, in tracing or purſuing a vein of ore, to dig under Combs, they find the ſtrata beneath as regularly placed and in the ſame direction as thoſe above, and where they are horizontal above they are horizontal below; which affords an undeniable argument that Combs were not formed by any Force from beneath, but by the operation of *ſome outward Cauſe.*

Now when we conſider the *general regularity, ſmoothneſs, gently-ſloping ſides,* and the *gradually-increaſing length, breadth, and depth of Combs or Gills,* we can attribute the Cauſe of their formation to no other Agent than *Water,* that formerly covered the tops and ridges of the Mountains and Hills where theſe ſloping Hollows are now found, and which, by deſcending from thence, gradually tore and furrowed the earth into ſo many *alvei* or channels, juſt in the ſame manner as water, falling in a ſudden and great thunder-ſhower, and retreating from the hills above towards the ſea or any great river, tears and wears channels in the ouze or mud upon the ſhore.

ANOTHER mark—that Gills and Combs were formed by *currents of water*—is the *ſerpentine ſhape* or winding courſe of ſuch as are long and large, and the apparent cauſes of ſuch deflexions or curvatures. For water deſcending from the mountain-tops would of courſe be diverted from a rectilineal motion (eſpecially if it ran for any conſiderable

conſiderable length) by reaſon of the different ſtrata, or different conſtitution of the ſame ſtrata it acted upon; ſome parts being hard, others ſoft, ſome having but few, others many and large cracks, &c. and according to the different circumſtances of theſe accidents the courſe of the water would be varied, and the ſtream occaſionally diverted from the parts that reſiſted moſt towards thoſe that reſiſted leſs: and on the ſame account, there would be many and various ſtreams ruſhing down the ſides of the ſame mountain, and as theſe would be irregular and winding, two or more would frequently unite, particularly the leſſer fall in with and join the larger; and of this there are manifeſt marks and the effects now remaining; for it is common to obſerve at ſuch places where a long and large Comb begins to turn off, that there is a furrow or channel now viſible upon the ſurface of the earth, and the Comb is deflected from its former courſe according to the angle in which this furrow meets it (allowing for the ſize of the furrow) and alſo is proportionably broader and deeper according to the ſize of this concurring channel; manifeſtly ſhewing, that where the ſtream that formed this leſſer furrow met the larger, that there the deflexion would naturally begin, the Comb be turned off and enlarged, in proportion to the additional force of the Current that formed this leſſer channel.

MANY ſuch obſervations as theſe might be made, if we were to conſider particularly and minutely the form and ſituation of the mountain or hill in which the Comb lies, the conſtitution

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and poſition of the ſtrata within, the courſe of the fiſſures, the ſhape of the valley beneath, the diſtance of the ſea, or any great lake, &c. from each and all of which many and different proofs might be drawn, plainly indicating that Combs were formed by currents of water; but theſe are eaſier to be ſeen and diſcovered by a ſpectator than to be deſcribed to a reader; and they will be very evident to any one that has had but the hint given him, that Combs and Gills were channels torn in the earth by the deſcent of water from the upper lands.

And what has been ſaid above in relation to Gills may in a great meaſure be applied to *Dales*; which begin at the end of two or more Gills, and gradually increaſe in length, breadth, and depth, in proportion to the number and ſize of the Gills that lead into them; juſt in the ſame manner, and as evidently by the ſame means, as the larger Combs were increaſed and opened by the ſtreams of water that tore the leſſer channels that enter into them.

As the Dales fall off from the mountains, and meet or unite at a greater or leſs diſtance, a ſtill larger Hollow preſents itſelf; which gradually opens and dilates as the former, and conſtitutes what we call a *Valley*; of greater or leſs extent and dimenſion according to the number and ſize of the Gills and Dales that deſcend into it.

At laſt, at a great diſtance from the mountains, two or more vallies unite, and open into a wide extenſive *low-land Plain*, or rather a *gently-declining Country*, which adjoins to the *Sea-ſhore*; the

the bottom of which (eſpecially if it is of a ſoft yielding nature, not rocky and ſtony) is of a ſimilar form, continues the ſame declivity, or gradually grows deeper and deeper 'till it ends in an unfathomable Abyſs.

AND thus does the Whole clearly point out the effects of a Flood of water that formerly covered the mountain-tops, and retreated therefrom down to, and even beyond, the very depth of the ocean; forming (in its paſſage from the ſurface of the earth to the center) high up (where its force was weakeſt) the leſſer channels or *Gills* and Combs; and where ſeveral ſtreams united, the *Dales*; and where the currents, that made the dales, met and joined their forces, hollowing out the *Vallies*; and where the torrents that ſcooped out vallies opened and expanded themſelves, there forming the *wide low-land Plains*—*gradually declining Sea-ſhore* and—the *ſloping boſom of the Ocean.*

HAVING thus, ſafely and truly, I hope, conveyed the reader from the tops of the higheſt mountains down to the bottom of the deepeſt Seas, we will now take a review of the paths we have trod, and draw ſome ſuitable concluſions from the whole.

1. FROM what has been ſaid, we may ſee the error of his Lordſhip's opinion concerning the origin of mountains, p. 88, viz. "That when the Fountains of the great Abyſs were broken up, and an immenſe hollow was excavated out of the earth from pole to pole, as a bed for the ſea to lie in; when the rocks, and the ſands, and the ſhells,

ſhells, and the earth, that were taken thereout, were thrown upon the land, and raiſed in mountain upon mountain, ſo as to aſſail the ſkies and invade the region of the clouds; when Promontories, and Capes, and Head-lands ſtarted up in an irregular order, &c." or as it is elſewhere deſcribed, p. 118. " At the time of the breaking up the fountains of the Abyſs, a great part of the materials, which were ſcooped out of the earth, as well as thoſe which then lay on the ſurface of the ſand and of the ſhore, would be looſe, ſeparate, and divided, and would float irregularly in that confuſion of elements, which ſuch a wonderful operation muſt have occaſioned, not only when ſhowered down in cataracts from on high, but alſo when conveyed by the force of the waters of the Sea, which guſhed forth, as out of a womb, to the place deſtined for their abode; where this heterogeneous maſs would ſubſide, and form itſelf into ſuch Hills and Mountains, of ſuch a mixed kind of materials, as we now find them to be, according to the wiſe deſignation of the great Author of Nature."

Such was the Manner, ſuch the Means, according to his Lordſhip, by which Mountains and Hills were produced. From whence it ſhould follow, that Mountains and Hills are no more than huge heaps of *Rubbiſh*, thrown out of the Sea, or the place where the ſea now is, by *the omnipotent Hand of God*; — as his Lordſhip more clearly aſſerts, p. 108, and 115. But this referring to the firſt Cauſe, when the operation was manifeſtly performed by ſecond Cauſes, is boldly

cutting

cutting the Gordian knot which we cannot fairly untie, and ſhews neither the Philoſopher nor the Divine in this caſe; for both the Word of GOD, and the whole face of the earth, declare the contrary, as I have already ſhewn at large, and ſhall conclude this ſection with the Teſtimony of another Author againſt this opinion. "We are to conſider that a great many Mountains of the Earth are far diſtant from any ſeas, as the great in-land Mountains of *Aſia* and of *Africk*, and the *Sarmatick* Mountains and others in *Europe*; how were theſe great bodies flung through the air from the reſpective ſeas, whence they are taken, to thoſe places where they ſtand? What appearance is there in common reaſon or credibility, that theſe huge maſſes of earth and ſtone that ſtand in the middle of continents, were dug out of any ſeas? We think it ſtrange, and very deſervedly, that a little chapel ſhould be tranſported from *Paleſtine* to *Italy* over land and ſea, much more the tranſportation of Mount *Atlas* or *Taurus* through the air, or of a range of mountains two or three thouſand miles long, would ſurely upon all accounts appear incongruous and incredible: beſides, neither the hollow form of mountains, nor the ſtony matter whereof they commonly conſiſt, agrees with that ſuppoſition, that they were preſs'd or taken out of the channel of the ſea. — Then too, we are to conſider, that the mountains are not barely laid upon the earth, as a tomb-ſtone upon a grave, nor ſtand as ſtatues do upon a pedeſtal, as this opinion ſeems to ſuppoſe; but they are one continued ſubſtance with the body of the earth,

earth, and their roots reach into the abyſs; as the rocks by the ſea-ſide go as deep as the bottom of the ſea in one continued maſs: and 'tis a ridiculous thing to imagine the earth firſt a plain ſurface, then all the mountains ſet upon it, as hay-cocks in a Field, ſtanding upon their flat bottoms. There is no ſuch common ſurface in nature, nor conſequently any ſuch ſuper-additions: it is all one frame or maſs, only broken and disjointed in the parts of it."

2. FROM the above deſcription of things appears alſo the abſurdity of the opinion, that is at preſent ſo much in vogue in *France*, concerning the origin of mountains [b], viz. — *That Mountains are only Heaps of Sand and Mud, formed by the agitation of the waters of the ſea, which were chiefly put into motion by the flux and reflux of its waves in tides, or ſome ſtrong currents that met and oppoſed each other, during the time when the whole ſurface of the earth was covered with water (for the maintainers of this ſyſtem allow that it has been thus covered). The Sand and Mud having been thus collected and heaped up together, and the water ſubſiding and ſinking to occupy the cavities at the bottom of the ſea from whence the ſand and mud were excavated, the dry-land by this means and mountains were raiſed upon the whole ſurface of the earth.*

BUT ſurely the Authors of this hypotheſis could never have obſerved the effects of the Agent, which they ſuppoſe to have been the Former of mountains, during any violent agitation of the ſea, nor have obſerved the inward Conſtitution, or outward

[b] See Meſſrs. LE CAT's, BUFFON's, DE MAILLET's, &c. writings.

ward Form of Mountains. For with regard to the firſt of theſe articles, as his Lordſhip juſtly remarks (in his Anſwer to this Syſtem of the origin of Mountains, p. 11) " The Sea, in its greateſt agitations, always levels every thing in its power, inſtead of raiſing it into Hills and Vallies. And if theſe Authors will but make the experiment of raiſing a Mound within the reach of the Tides, and let but a ſingle Spring-tide get above their works, I believe, inſtead of finding their Mound increaſed into a Mountain, they will find their Mountain reduced into a Mole-hill, if not entirely carried off and levelled with the bottom of the Sea."

And, in oppoſition both to his Lordſhip's ſyſtem and that of theſe Authors, it muſt be remarked, that the *inward ſtructure* of Mountains undeniably diſproves each of their opinions. For, mountains conſiſt of a regular ſtrata or beds, (whether of ſtone, coal, clay, &c.) orderly poſited upon each other, and in an horizontal direction; and beſides, each reſpective ſtratum is of equal thickneſs throughout, though they continue for ſeveral miles in extent; — all which clearly demonſtrates that the whole ſettled in a regular and ſucceſſive order, during a quiet and calm ſea, or without the leaſt perturbation of the water it ſubſided in. And ſince thoſe parts, that now remain and are viſible, of the Maſs that thus ſettled, viz. the Mountains and their tops, ſtill retain their firſt and horizontal direction, it is evident that they have not been diſplaced or their poſition altered; and alſo that they have not received any new or freſh Matter to

cover

cover them (except the vegetable mould, and a few feet of looſe ſtones and ſludge; of which hereafter); neither were they formed by occaſional or ſucceſſive additions of Sand and Mud, or heaps of Rubbiſh; for had this been the caſe, there would have been no regular ſtrata or layers of ſtone, coal, clay, &c. or if there had been ſuch, they would have been inclined on all ſides, or ſhaped according to the *outward form* of the mountain, and have covered theſe conical or priſmatical Eminences like ſo many *caps* or *arches laid one upon another*; neither could the layers have been of the ſame thickneſs throughout even in a ſingle mountain (much leſs in hundreds or thouſands) but would have been much thicker at bottom than at top; at leaſt thoſe layers that ſettled laſt muſt have been formed thus; for when the Mountain had attained to any conſiderable ſize, and a new layer or ſediment of looſe matter ſubſided on it, the far greater quantity would fall down on each ſide, and ſettle moſt at and round the bottom, with thin edges towards or near the top; which is a form that, I believe, no mountain upon earth has.

But what farther ſhews, that Mountains are not Heaps of Rubbiſh thrown out of the ſea, or quantities of Sand and Mud confuſedly coacervated, is, the general uniformity of their ſhapes, their regularly-ſloping ſides, the manner in which Chains or Ridges of Mountains are continued, being extended length-ways upon ſuch iſlands and peninſulas as are longer than they are broad; and ſhooting out, like branches from a ſtock, from

high extenſive Plains upon the larger Continents of the earth: and then the Gills gradually falling off from the mountain-tops, and meeting the Dales down their ſides, the Dales uniting with the Vallies, and the Vallies opening into extenſive declining Countries, and theſe adjoining to the ſhelving Bed of the Ocean — all manifeſtly ſhew, that the Agent that formed mountains did not act from the Sea upward, or towards the inland countries, and amaſſed together large heaps of ſand and earth, but deſcended from the mountain-tops, or the moſt inland parts of the earth, and furrowed or made its way down towards the very bottom of the Ocean, carrying before it almoſt every thing that was moveable or oppoſed its paſſage.

3. FROM the above-mentioned uniformity in the ſhape and courſe of Mountains, and the apparent cauſe thereof, and from the regular manner in which Gills, Dales, and Vallies deſcend from the mountains and run into each other, gradually declining towards the Sea, it is alſo evident that Mountains were not owing either to any *irregular Elevation* or *Depreſſion* of the ſtrata of the earth: for had either of theſe been the Cauſe, this regularity could never have been preſerved, and been viſible over the whole face of the earth. So that neither Dr. *Burnet*'s, nor Dr. *Woodward*'s, and Mr. *Whiſton*'s Syſtem of the origin of Mountains is true or conſiſtent with the face of Nature; the firſt of whom ſuppoſes them owing to a ſudden depreſſion or ſinking in of the ſtrata of the earth, and the other two to as ſudden and violent a Depreſſion of ſome of the ſtrata and Elevation

tion of others; for upon either of theſe ſchemes, the earth muſt have exhibited the moſt ghaſtly appearances of Rocks and Precipices, and the whole form of it would have reſembled the ruins of a deſolated edifice, that had been thrown down by a Tempeſt, or blown up by a ſubterranean exploſion: ſo that there would have been no traces of the operation of a Fluid Agent that deſcended from the mountain-tops, and gradually tore its way quite down to the Sea, and ſo formed the regularly-ſloping ſides of Mountains, the eaſy and natural Cadence and Connexion of Gills with Dales, Dales with Vallies, &c. And,

4. This ſame regularity and uniformity in the riſings and fallings of the higher and lower lands, and their mutual dependences on and inclinations with each other, remaining the *ſame at this day* in all countries, manifeſtly ſhews, that there have been no Mountains or Hills, Dales or Vallies, made ſince the Deluge, or the Inundation that cauſed the preſent; and therefore that Mountains are not *continually a-forming*, as ſome of the modern *French* philoſophers aſſert; neither were they *occaſionally* thrown up by earthquakes or ſubterranean eruptions, as ſome of the old philoſophers imagined: indeed earthquakes, and ſuch like exploſions, inſtead of raiſing new mountains, rather tend to throw down the old, by ſhaking and diſlocating the land, where the violence of the concuſſion prevails, and ſinking it beneath the Ocean or into the Abyſs; and beſides, earthquakes generally happen near the ſea, and affect not inland eminences or mountains.

5. NEITHER could the channels of Gills, Dales, and Vallies have proceeded from contractions or lateral ſhrinking of the ſtrata of the earth (and ſo the parts of the earth above, or on each ſide of theſe cracks, be left eminent or in the form of mountains) in the ſame manner and by the ſame means as Chaps or Cracks are made in the mud, and ouze upon the ſea-ſhore by the heat of the ſun-beams and action of the wind, according to the opinion of ſome of the ancients. But had this been the caſe, as the tops of the mountains were dry ſooneſt and moſt expoſed to the influence of theſe two agents, the Combs and Dales would have been deepeſt near the ſummits of hills and mountains, and gradually have leſſened, or been ſhallower and ſhallower as they proceeded down the ſides, and terminated in a point at the bottom of mountains; but the direct contrary to this is their form; therefore This could not have been the Cauſe. Beſides, ſuch Contractions as theſe could never have made *Eminences*, nor would there have been any difference between Mountains and Hills, neither would the inland parts of Continents and large iſlands have been the higheſt, as I have plainly ſhewn they are; for when the mud upon the ſea-ſhore, or when the ground in large flat and low marſhes is dried and cracked in the ſummer-time, the parts or pieces of land between the cracks are equally high, and the whole ſurface level.

THOUGH indeed thus much may be ſaid for this opinion, that the Cracks and Fiſſures that were made in the ſhell of the earth (after it had ſettled,

ſettled, ſaturated with water, and the Expanſe from above and from below had compreſſed and hardened, and ſo contracted the ſtrata in ſome places, and thereby left *gaps* and *fiſſures* in others,[c] ſee p. 88.) gave room for the water that covered

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[c] Or, to give an account of this Effect in the words of a modern writer, " Firſt then theſe Fiſſures are no more, as they ſeem to me, than the neceſſary conſequences of the firſt ſettlement of matter, when it was divided into wet and dry, ſolid and fluid. That we may the more clearly apprehend this, let us recollect what happens to ſmall maſſes of matter, cloven by like fiſſures, whence we may infer what is probably the cauſe of thoſe greater clifts which we are now in ſearch of. We all know that ſlime, diluted clay, and pulverized or diſſolved ſtone ſhall occupy more ſpace in that ſtate of moiſture than when the ſame clay, ſlime, or ſtone becomes dry and hard; and from a parity of reaſon we may argue, that when ſolids and fluids formed, and from a ſtate of chaos became divided into, diſtinct bodies, the parts of the former being deſerted by the latter, muſt needs grow cloſer together, and conſequently leave chaſms and crevices betwixt them. But the maſſes of earth, ſtone, and clay were not at this time meerly paſſive; they formed larger and more compact bodies every where, in proportion to the quantity and mutual attraction of their ſimilar parts, within proper diſtance. Hence aroſe firmer combinations, and conſequently greater openings between ſuch maſſes. Farther, it muſt be obſerved, that as all ſimilar particles ſtruggled to come into contact with each other, ſo, at the ſame time, they deſerted, and repelled, and expreſſed all diſſimilar and contending particles; conſequently maſſes of differently-natured particles receded and fled from each other, every party (if I may uſe the expreſſion) tending to form and ſtick cloſe to its like: betwixt ſuch different ſubſtances therefore, attracted here and there repelled, ſome chink or interval muſt needs happen. Theſe cauſes then, *viz.* the deſertion of moiſture, the union of ſimilar and the mutual repulſe of diſſimilar particles, muſt all have contributed to form the maſſes of our terraqueous globe into ſuch ſeparate portions as we now find them in; for that indeed it was not poſſible for bodies to grow hard and dry, unite and contract, without leaving ſome chaſms and fiſſures between them. What enſued upon the hardening of particular and ſmaller maſſes enſued alſo in the larger portions of the whole earth, in proportion to the quantity of ſolids united at any one effort, whether a *grain*, a *ſtratum*, a *county*, or a *region*." BORLASE's *Nat. Hiſtory of Cornwall*, p. 144.

the earth during the deluge to deſcend through into the Abyſs; and ſuch as ſerved for this purpoſe directed, in ſome meaſure, or were the cauſe of the direction of, the courſes of the Vallies, Dales and Combs; but they neither did nor could have formed them for the reaſons above given: beſides, theſe Cracks are ſeldom above eight or ten feet broad (and generally much leſs) and ſeveral vallies are as many miles in breadth, and exceed them as much in length as they do in breadth; and what is more remarkable, the Cracks and Veins of ore in many places run directly acroſs the vallies, and yet the vallies continue on in their uſual courſes; which plainly ſhews that they were neither formed, nor even altered, by theſe cracks. But, in ſhort, the ſea-ſhore itſelf (from whence the above hypotheſis is brought) affords a manifeſt difference between the Cracks made by ſhrinking and the regularly-increaſing Channels of Combs, Dales, and Vallies; for upon the ſea-ſhore or the banks of a large river, eſpecially where there is any quantity or depth of mud and ouze, the chinks cauſed by the action of the Sun-beams and Wind are nearly throughout of the ſame ſize, meet and interſect each other at almoſt all angles, chiefly at right, and ſo divide the parcels of ground or mud between into ſquares, pentagons, or ſome ſuch figure, but never, or ſcarcely ever, into long ridges like the chains of mountains. And what is farther obſervable in the ſame place, the Channels or Gullies tore in the mud by the retreat of the ſea-water in ebbing, or by the deſcent of land-floods,

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do really leave the interjacent land in prominent ridges juſt like thoſe of Mountains; and thoſe gullies or little furrows gradually increaſe in length, breadth, and depth, as they unite and fall in with each other, juſt in the ſame manner as Gills, Dales and Vallies do; which manifeſtly ſhews, that both kinds were formed by currents of deſcending water.

6. SINCE there are Mountains and Hills, Combs, Dales, and Vallies upon the *whole ſurface* of the earth, and theſe were cauſed by the retreat of Water from the ſurface, it is certain, that the Deluge that formed them was *univerſal*: and I have already proved that there never was but one univerſal Flood, which was that recorded by *Moſes*.

7. SINCE Gills, Dales, and Vallies fall away from the Mountain-tops, and tend in their courſes down towards the neighbouring ſeas, and are united to the ſhelving Bed of the Ocean, nay, ſince ſome of the chains of Mountains are continued under the ſea, and appear again on the oppoſite land; or, what is more, ſince there are Mountains and Hills, Dales and Vallies, *even entirely under the ſea*,[d] it is evident, that the water that formed them deſcended not only down *towards* the ſea, but even *beyond* it, into ſome great Cavity in the inſide of the earth; for had it reached no farther than the preſent ſurface, or even any conſiderable way into the bed of the Ocean, its

[d] KIRCHER's *Mundus Subterraneus*, p. 69, 96, &c. MARSILLI *de la Mer*, p. 3—12. BOYLE's *Philoſophical Works*, Vol. III. p. 2, 3.

waves much have been reverberated or returned upon themſelves, and ſo would ſoon have loſt all their force: but ſince this force continued, and cut and tore the earth under the ſea to unfathomable depths, we may juſtly ſuppoſe that the water deſcended far beyond, entered into, and filled up a large Concavity within the earth, and ſo conſtituted what *Moſes* calls the ABYSS.

8. SINCE the Water that ſcooped out the hollows of Combs, Dales, and Vallies deſcended into the Abyſs, it muſt of courſe have carried with it all that quantity of the earth which it tore away for making theſe hollows; and as it deſcended from every part of the earth's ſurface down towards the center, it would at laſt repoſit and ſettle the whole there, in form of a *central* or *inner globe* or *nucleus* of terreſtrial matter, ſurrounded on all ſides by the water of the Abyſs. To which, or to a ſimilar kind of nucleus, moveable in a fluid medium, Dr. *Halley* aſcribes the *Cauſe* of the *variation of the magnetic needle*,[e] and to which not only this, but many other and far greater effects, both in and on the earth, are to be attributed. And,

9. WHEN we conſider the great length, breadth and depth of the larger Vallies upon the earth, the multitude of the leſſer, together with the numerous Combs and Dales that lead into them—the Height of the Mountains and inland Eminences above the lowland, their diſtance from the Sea, or rather, from the correſponding Chain of Mountains on the oppoſite Continent—the vaſt Bed

[e] *Philoſ. Tranſ.* N°. 148, 195.

Bed of the Ocean, the cavities of all the Lakes, Rivers, &c. I ſay, when we conſider all this, and reflect, that all theſe Hollows were once filled up with the ſolid ſtrata or ſubſtance of the earth, from the top of one ridge of mountains to the oppoſite, and from that to the next beyond, and ſo on quite round the globe, (which therefore, *during the height of the Deluge*, before the waters began to retire, was entirely ſpherical, and without any inequalities, or the leaſt riſing and falling, of hill or dale, ſee p. 85, &c.); and that all this ſubſtance was ſcooped or hollowed out and carried down into the Abyſs, we may ſuppoſe the *central nucleus* to be of ſome *conſiderable bulk* or ſize.

But the Agent that did all this, the Water that thus tore and ſwept away the ſolid rocks, and left ſuch deep and wide marks of its power, muſt be *great in quantity* beyond conception, far exceeding what might be ſufficient barely to fill all theſe Hollows, for it muſt have paſſed over and through the ſolid rocks, where theſe Hollows are, many times, before it could have made ſuch gradually-worn channels, and have opened ſuch extenſive breaches; and therefore be far ſuperior in quantity to the bulk of the whole Ocean itſelf, and all the water that fills every other Cavity upon the earth; for all theſe Cavities were made by the *repeated actions* of this deſcending Flood. And ſince the Tendency of theſe Hollows and Channels plainly ſhews, that the Water that harrowed them deſcended down towards the Ocean or the ſeveral Seas upon the earth, and ſince the water in them is not ſufficient in quantity

tity to have effected all this, there muſt be (from a conſideration alone of the quantity of Water neceſſary to cauſe theſe effects) a large Reſervoir or an Abyſs of Water beneath the earth; which, during theſe Tranſactions, muſt have been elevated far above all the higheſt Mountains or Eminences upon the whole ſurface of the earth; and therefore the Deluge at that time univerſal, and cauſed not barely by an effuſion of the waters of the Ocean, but principally by thoſe of the *Abyſs*, according to the deſcription given by *Moſes*.

II. ANOTHER *general* argument (including, like the former, ſeveral particular ones, and deduced alſo from the circumſtances of things upon the ſurface of the earth) in proof of an *univerſal Flood*, may be drawn from the conſideration of the *nature, form, and ſituation of ſeveral bodies or ſubſtances that at preſent lie looſe upon the ſurface of the earth*. For,

1. IT is common to obſerve upon the ſides, and even the ſummits, of the higheſt Hills, Mountains, and inland Eminences (eſpecially ſuch as conſiſt of ſolid ſtrata or hard rock within, and have long flats or any level ground at their tops) a prodigious number of *Stones*, of various ſorts and ſizes, but generally of *one* or *nearly the ſame form*; being either perfectly *ſpherical* or *oval*, or ſome way or other tending to a round figure; their ſurfaces or outſides being quite ſmooth, without any projections or angles.

I HAVE obſerved multitudes of ſuch ſtones, of all ſizes—from ſome that were eight or ten feet in circumference to others that were but two or three

three inches in circuit—lying upon the tops and ſides of ſome of the higheſt hills and eminences in *England* and *Wales*; particularly upon the long chain of Mountains that run through the middle of *South Wales*, and upon the high lands in the northern parts of *Worceſterſhire*, *Warwickſhire*, *Shropſhire*, and *Staffordſhire*: and thoſe large ſtones that lie upon the *weſtern* ſide of *Shotover* hill, near *Oxford*, and which, on account of their Roundneſs, are called by Dr. *Plot*, *Lapides Teſticulares*,[f] are of this ſort. So alſo upon *Marlborough* Downs, in *Wiltſhire*, are an inconceivable number of large ſtones, which, from their ſhape and ſituation, are called the *Grey-Weathers*, as reſembling a flock of ſheep lying down; and many of theſe, eſpecially ſuch as lie at a diſtance from the center or middle of theſe ſtones, are quite round and ſmooth, though vaſtly large.

Mr. *Hutchinſon* ſays, that he obſerved, "many ſuch round ſmooth ſtones, of various ſizes, from the bigneſs of a melon to an hundred weight, lying, not only upon the ſides, but upon the tops and ridges of the high hills in the *North* of *England*, particularly in *Arkendale*, and in many other places; and alſo in *Cornwall*, and in *Devonſhire*, upon *Dartmoor*."[g] Dr. *Liſter*, in *Phil. Tranſ.* N° 164, remarks, "That all the high mountains and Woolds in the *North* of *England* are covered, more or leſs, with a quantity of *Sand*, mixt with white *pebbles* of a greater ſize."

Langius

[f] *Nat. Hiſt. of Oxfordſhire*, p. 129.
[g] Vol. XII. of his Works, p. 294.

Langius in his Preface to his *Hiſtoria Lapidum figuratorum Helvetiæ*, &c. or, *Hiſtory of the figured Stones in Switzerland*, ſtarts the following queſtion (but leaves it undecided); "Alſo it has often been inquired, Whether the *ſmooth round ſtones* and *flints* that are now found upon the tops of the higheſt mountains, even of the *Alps*, where no river can poſſibly paſs, were thus ſmooth and round by nature, or whether they were at firſt and originally *rough* and *unequal*, and then afterwards *ſmoothed* and *rounded* by currents of water, during the Deluge, and carried to the higheſt mountains?[h]"

Dr. *Balthaſar Ehrhart*, in the account he gives of his Journey from *Memingen* over the *Tyrolenſian Alps* (ſee *Phil. Tranſ.* N°. 458, for 1740) makes

[h] *Cæterum de Silicibus ſubrotundis & lævibus*, &c. It may be proper to remark here, with Dr. *Woodward*, (ſee his *Cat. of Engliſh Foſſils*, p. 83.) "That the *Daniſh*, *German*, and other writers of Foſſils do not reſtrain the name *Silix*, to what we in *England* call *Flint*, but apply that name to very various bodies;" and alſo that the *Romans* (as the Doctor proves at large, p. 22.) did the ſame; underſtanding by it any very hard Stone that would ſtrike fire, as indeed moſt hard Stones will. I mention this, becauſe the bodies which we in *England* call *Flints* are ſometimes found, and were ſo formed, *naturally* of a *round ſhape*; and it might be objected to the above quotation that the Flints therein ſpoken of might have been naturally of a round form, and ſo not have been worn by any agitation in water. But, firſt, I would obſerve that round flints are *very few* in compariſon of the number of others that are found in all kinds of ſhapes; and *Langius* himſelf, in the deſcription he afterwards gives of a *Flint*, or rather of the body he applies the the word *Silix* to (p. 13.), does not mention it as being *naturally*, or even *accidentally*, of a *round form*; and whatever he underſtands by the word *Silix*, it is certain that the bodies he ſpeaks of in the above quotation carried in themſelves evident marks of having *been worn*, *ground down*, and even *rounded*, by *water*; otherwiſe he would never have thought of putting the above queſtion.

makes the following obſervations, " The mountains of *Memingen*, which are higher than the middle of the higheſt mountains in theſe parts, have upon their very ſummits vaſt quantities of Stones about three or four inches in circumference, that have been plainly *worn round*, and juſt after the ſame manner as thoſe that are thus formed by the ſtream and attrition of rivers. But it is manifeſtly evident that this immenſely large heap of Stones, which lie, as it were, in a ſeparate and detached manner upon theſe mountains, where *no river flows*, could never have been formed by currents of this kind. Another remarkable circumſtance is, that theſe Stones are found to increaſe in bulk or diameter from *Memingen* towards the *Alps*, ſo as at laſt to equal maſſes or trunks three or four feet thick, but from *Memingen* towards the oppoſite country and more remote from the *Alps* they proportionably decreaſe leſs and leſs, ſo as at laſt to be reduced to a ſpecies of groſs ſand. This remarkable phænomenon, which may ſerve to explain the theory of the earth, may be accounted for from the following obſervations and reflections. I have obſerved among the *Tyrolenſian Alps* whole and entire ſummits of Mountains, that have in *one continued rock* the very ſame kind of ſtone with that which is now found in *ſeparate* and *worn parts*, and placed at a diſtance in the country between the *Alps* and the *Danube*. There are alſo juſt as great a variety of theſe worn ſtones as there are of Rocks in the *Alps*. The cauſe which broke the *Alpine* rocks, and covered all this part of *Germany* with fragments torn from thence

thence (and which were afterwards rounded by the mutual attrition between themſelves and the waves), could be no other than *the great deluge.* — The fragments of ſtone which were torn from the ſhattered *Alps* (which were as high again as they are at preſent before the deluge) the farther they were carried and the more they were rolled, the more were they worn and leſſened. Hence the places the neareſt the *Alps* were covered with the largeſt fragments, thoſe that were more remote with the ſmalleſt. The exact agreement between the moſt broken pieces of theſe ſtones, and the larger and entire rocks in the *Alps*, demonſtrate to the eye the place from whence they came, and that the former are no other than the diſperſed ruins of the latter."

Swedenborg in his *Miſcellanea Obſervata*, &c. p. 11, ſpeaks of Mountains in *Sweden*, " *Qui lapides habent admodum tritos, & quaſi politos, & mixtos cum arenis*;" i. e. which have *ſtones* upon them that are *much worn*, and as it were *poliſhed*, mixed with *Sand*." Biſhop *Pontoppidan* in his *Hiſtory of Norway*, p. 56, ſpeaking of the effects or conſequences of the Deluge, writes thus, " This [*i. e.* the Deluge] is likewiſe the origin of *moſt* of thoſe *Pebbles*, which are found ſcattered in *all parts* of the *globe*."

And indeed, I think, we may fairly conclude from the inſtances I have brought, that, if all parts of the globe were examined by proper and judicious perſons, ſome ſuch *round* or *ſmooth Stones* as the above mentioned, lying at greater or leſs

diſtances,

diſtances, in greater or ſmaller numbers, would be found upon them.

THE Point therefore to be decided is, *How came theſe Stones to be of this round ſhape?*—Were they *originally* thus?—Or, *formed ſo afterwards?*—And *by what means?*

THAT theſe ſtones were *not originally* and at firſt of their preſent figure, is evident from many particulars; as,

1. FROM ſome of them having on their outſides the baſes of hexagonal ſhoots of ſpar and chryſtal, which are now of a round or circular form at their tops, whereas it is well known that theſe naturally terminate or end in ſharp pointed angles, wherever there is room or ſpace for them to ſhoot, and ſuch there muſt have been here, if theſe ſtones had always been of the ſame ſhape and ſize: ſo that as theſe ſhoots of ſpar were once longer, and alſo pointed at top, and being now round or hemiſpherical, it is manifeſt, that they have been worn and ground down to this form by ſome regular attrition.

2. FROM ſeveral of theſe Stones having now lying immerſed in them and united with their ſubſtance, the ſhells, teeth, and bones of various animals, pieces of wood, coral, &c. all of which bodies are naturally of ſome determinate figure, and greatly differing from each other, and yet ſuch parts of theſe ſhells, bones, corals, &c. as appear on the outſides of theſe Stones ſhall be round or circular or anſwerable to the outward ſhape of the ſtone; and yet the parts which lie immerſed within the ſtone ſhall be of the true, uſual,

uſual, and natural form of theſe bodies; nay, when the ſtone is broken, there ſhall frequently be found in the inſide the ſame ſpecies of ſhells, corals, &c. quite whole and entire, as thoſe on the outſide, which are now ſhaped to the figure of the ſtone; and therefore theſe on the outſide were formerly of the ſame ſhape as thoſe in the inſide; and of courſe both Shells, Corals and Stone muſt have been rounded or brought to this unnatural, ſpherical, figure by ſome external force or agency.

The ſame is manifeſt from the Contraſt between the manner in which the *conſtituent parts* of theſe Stones *originally ſettled* and their *preſent outward form*; it being evident to ſight, particularly in the larger ones, and eſpecially in ſuch as are of a fiſſile nature, that they ſettled in a flat regular manner, or in lines, layer upon layer, each of equal length, breadth, and thickneſs in all its parts; which could not poſſibly form a body of a ſpherical ſhape; but as theſe are now of an orbicular form, they muſt have been reduced and rounded by ſome outward force. But

4. Where theſe Stones occur, the far greater number of them are generally of the ſame kind, contain the ſame ſpecies of ſhells, corals, &c. and apparently ſettled in ſtrata of the ſame ſize and order, as the Stone or Rocks in the adjacent Mountains; and ſo afford an undeniable proof that they are only *fragments* or pieces torn off from the adjoining mountains; and therefore were not originally of the ſame ſize and form as they are now;

now; but have been, ſince their ſeparation, much leſſened and worn into a round figure.

And their *ſhape* and *ſmoothneſs* manifeſtly ſhew, that they obtained their form in, and by the motion of, a *wet Fluid*, ſuch as *Water*; for had they been ſubjected to the action of a dry Fluid, ſuch as the Air, in a violent wind or tempeſt, &c. it could not be but that they would have been of the moſt irregular forms, and their outſides jagged and pointed with angles or emboſſed with protuberances in every direction; but ſince they are ſo regularly rounded and their ſurfaces ſo extremely ſmooth, they muſt have procured their ſhapes from being agitated in and by a moiſt Fluid, ſuch as could penetrate and mollify their outward parts, and ſo permit them to be worn away, granule after granule, or by a gradual attrition.

And when we conſider the great ſize and weight of ſome of theſe Stones, their immenſe number, and the vaſt extent of ground that in ſome places they are ſpread over, (nay that there is reaſon to ſuppoſe that they are in ſome meaſure ſcattered over the whole face of the earth) it may fairly be concluded, that there is no *moiſt Fluid*, in or upon the earth, in a quantity ſufficient for effecting this, but *Water*; which therefore muſt have been the Medium in which, and the Agent by which, this wonderful phænomenon was tranſacted.

As is moreover evident from the *manner* in which theſe Stones lie. Thoſe that are upon the long tops and flats of Mountains, or upon high level ground, are ſituated for the moſt part at a little

diſtance from each other, or lie in a ſeparate detached form [not heaped together or in trains]; for as upon ſuch even land there could be no inclination in the ground to determine them to one place more than another, and as the currents of water, that formed the Combs that deſcend on all ſides of ſuch high land, ſet different ways, ſo theſe Stones, that were ſhuffled and rolled about upon the top, would be left in the moſt irregular, looſe, detached or ſtraggling manner poſſible; and accordingly we ſo find them.

But thoſe that are upon the ſides of hills, eſpecially ſuch as are ſomewhat ſteep, and particularly at ſome conſiderable diſtance from the top, lie thick and cloſe, and heaped upon one another: thoſe that are in the Combs, Dales, and Vallies (that fall off from the Mountains) lie ſtill thicker and cloſer, and chiefly in the bottoms of ſuch cavities, there being few or none upon their ſteep ſides; and alſo tend in a train from the tops of theſe Cavities, and gradually increaſe in number and quantity, as the gills, dales, and vallies open and enlarge by receiving other gills, dales, and vallies into them; in which lateral gills and dales are alſo a few, the greater part having been carried down into the large vallies, where they lie in inconceivable numbers; and particularly in the curving parts of the vallies, juſt before their turnings; or where any rock, that withſtood the force of the Flood, or large fragment of a rock, that the waters could carry no farther, ſtands in the middle or any part of a valley, there theſe round

Stones

Stones are found in ſtill greater plenty for the depth of many feet under the ground.

And what is farther remarkable (and yet a general rule in this caſe) is this, that ſuch Stones of the above kind as lie near the beginnings of the Combs are leaſt worn, thoſe that lie farther down in the dales more worn, thoſe that lie in the vallies and in the low flat countries moſt of all worn and perfectly rounded, as having been carried fartheſt, and agitated moſt. — So that all of them manifeſtly bear the appearance of having been not only formed or rounded by water, but alſo of having been placed juſt in ſuch manner, as water alone, retreating from the mountain-tops down thro' the vallies, would naturally diſpoſe them[i].

[i] It is not uncommon to find among the Stones, that were thus apparently worn round by accident, ſome that were always or naturally of a round ſhape; and it may be proper to inform the reader how to diſtinguiſh between the one and the other; and alſo to ſhew how far even theſe laſt are ſerviceable in proving the point in debate. The Stones that are naturally of a round ſhape, and which are commonly called *Nodules*, have generally an outward coat or cruſt, differing from the internal part of the body, either in ſubſtance, colour, or hardneſs; or elſe conſiſt of ſeveral coats; and are uſually very hard: thoſe that are of the ſame ſubſtance throughout (as flinty, alabaſter nodules, *&c.* commonly are) when broken, ſplit or fall apart in all kinds of directions; thoſe that conſiſt of ſeveral coats of different matter open or ſeparate in pieces, that are convex on the outſide and concave in the inſide according to the ſeveral coats. On the contrary, Stones that are worn to a roundneſs, which was not natural to them, ſuch as *Pebbles* found upon the ſea ſhore, and thoſe that are now found upon the higheſt mountains, have never any coat or inveſtient cruſt, break regularly, or according to the grain of the ſtone, and frequently into a number of thin flat plates, like the ſtone that lies in ſtrata in the adjoining hills; and are generally either ſoft or hard, according to ſuch ſtone; and carry in themſelves evident marks (of which I have already recited at large the particulars) that they are

MANY other circumſtances there are (which will readily be perceived by an obſerver, though they are not ſo eaſily to be deſcribed to a reader) depending either upon the nature of theſe Stones, the conſtitution of the ſtrata in the adjoining land, or the ſituation of the ground, &c. that afford ocular

are pieces or *fragments* of the adjacents rocks, *worn round* by being rubbed againſt one another in ſuch a fluid as Water. And even the Nodules themſelves, that are ſometimes found among the Pebbles, exhibit manifeſt proofs of having been broken out of regular ſtrata, carried from their natural and original place, and of having endured the outward force or action of Water. For, firſt, in ſuch places where we find Nodules of flint, cryſtal, alabaſter, &c. lying looſe upon the ſurface of the earth, it is common to find the very ſame kind of Nodules immerſed in their natural beds in the ſtrata of the rocks adjoining, and very diſtinct and eaſily ſeparable from the ſubſtance of the rock (which is another mark by which Nodules may be known from rounded pieces of the rock): it is therefore reaſonable to believe that the Nodules, that are now looſe and detached upon the ſurface of the earth, formerly lay in, and were beaten out of, the adjacent rocks, by the ſame means or by the ſame flood of water, that parts of the rocks themſelves were broken off and worn round; among which theſe Nodules now lie. This alſo is evident from a circumſtance attending many of them, viz. that their outward coats have apparently been much rubbed and worn, eſpecially in the more prominent parts, and in ſome of them quite worn off. I have obſerved too that ſeveral of them have had parts or pieces of the rock, from whence they were originally torn, affixed to their outſides, which, though at firſt certainly of no determinate ſhape, have been, ſince their ſeparation, regularly rounded to the ſhape of the Nodules: nay, I have obſerved large Maſſes of the rock, containing ſeveral Nodules in them, thus worn and rounded; which manifeſtly ſhews, that even theſe Nodules are Fragments, or at leaſt were beaten out of the rock. Then, laſtly, Nodules, being found lying together with, and exactly in the ſame manner as, the mountain-pebbles and other worn fragments of ſtone, undeniably proves that they were poſited upon the places and in the manner they are now found by the ſame means that the inland-pebbles were, and though they do not ſhew ſuch ſtrong and clear ſigns of having endured the force or action of water as the pebbles (chiefly on account of their ſuperior hardneſs and original roundneſs) yet they exhibit ſufficient marks, as I have deſcribed above, of having been ſubject to its force.

ocular demonſtrations, that theſe *round Stones* are only *Fragments*, which were beaten off from the neighbouring rocks, and worn into their preſent figures, by the agitation of *Water*; — which fluid muſt therefore once have filled all the deep vallies, and have covered all the high hills and mountains where theſe Stones are now found.

But beſides this larger ſort of *round* or *Bowler Stones*, (as they are called in ſome parts of *England*, their very form indicating to the moſt ſuperficial obſerver that they have been rolled or *bowled* about) there is another kind of a leſs ſize, from ſome that are two or three inches in circuit to others that are as ſmall as peaſe, commonly known under the name of *Gravel*. This conſiſts of a variety of ſubſtances, not only of hard round and ſmoothed Stones of different kinds, but of parts of Bones, pieces of Shells, Coral, &c. that have been alſo rounded or worn [k], ſo as evidently to demonſtrate that the whole has been in agitation, and that ſuch a fluid as *Water* was the Agent.

Which is farther apparent from the *manner* in which, and the *places* on which, *Gravel* lies. It being always poſited in a looſe irregular form, not in a cloſe compact ſtate, or in uniform ſtrata of equal thickneſs in all parts, as the regular beds

[k] It may not be amiſs to obſerve here, that in ſome parts of *England* the inhabitants very improperly call any ſmall, looſe, rubble ſtones, though they are flat, pointed with angles, or of all ſhapes, provided they lie near the ſurface of the earth, by the name of *Gravel*; but unleſs they are anſwerable to the above deſcription, and apparently worn, or a great part of them worn and rounded, they ought not properly to be, neither indeed are they generally and commonly, ſo called.

of ſtone, &c. are; no, this is thrown or pitched, as it were, in ſtreaks or unequal ſeams, and in all directions, generally in an oblique, ſometimes in a wave-like form, juſt in ſuch manner as the undulating motion of departing Water would naturally caſt it. Beſides, it is uſually found free and void of all lighter, earthly, ochreous, clayey, or ſuch like matter, which, being ſoluble in water, would, when once aſſumed up therein, be contained longer and carried farther than (and ſo ſeldom ſubſide together with) the heavier and harder parts of *Gravel*; which therefore would be left clear and diveſted of all ſuch lighter matter; and indeed at preſent it appears to the eye to have been waſhed and cleanſed by Water. Then too Gravel is commonly found over unmoved and horizontal beds of ſtone, chalk, &c. and being of a nature different from theſe, and lying in a manner different from that in which the ſtrata of the earth originally ſettled, it is manifeſt that This has been moved, agitated, and brought from other places. And ſince great part of this mixt ſubſtance, *Gravel*, is of the ſame nature with, and conſiſts of the ſame kind of ſhells, corals, &c. as thoſe which are found in the higher lands or in the grounds above, it is an evident proof that it was brought from theſe lands.

And when we conſider the *places* where Gravel is commonly found, viz. either upon extenſive flats juſt under mountains or higher ground, or in the bottoms of large vallies, or elſe ſpread over low-land gently-declining countries, but ſeldom or never (or but in very ſmall quantity) upon the tops

tops or even ſides of ſharp-pointed and ſteep mountains, it affords an additional and undeniable evidence, that it was brought from the upper lands; and being diſpoſed or poſited juſt in ſuch manner and juſt upon thoſe places where water, retreating from the higher grounds, would naturally throw or leave it, it evidently ſhews, that Water was not only the Cauſe of the *form* or *roundneſs* of the various *parts* of Gravel, but of the *Diſpoſition* or *Settlement* of the *whole*.

SUCH is the form and ſituation of *Gravel* in *England*; and no doubt is to be made but that it is the ſame or ſimilar in every part of the earth where it is found; and ſince there is ſcarce a country over the whole globe but what has it, more or leſs, ſo it is certain that all theſe countries, or the whole face of the earth, have been overſpread by *Water*.

UNDER this article may alſo be reckoned a ſtill leſſer ſpecies of round ſtones than any of the above-mentioned, viz. thoſe which conſtitute what we commonly call *Sand*; this ſubſtance "being really no other (as Dr. *Woodward* juſtly obſerves, *Nat. Hiſt.* p. 188) than very ſmall *pebbles*; as may appear to any one who ſhall carefully examine it, eſpecially with a good microſcope." And when thus viewed and magnified, the various bodies of which it conſiſts as manifeſtly exhibit marks of having been worn or ground down to their preſent ſize and form by the agitation of water, as the parts of Gravel do. Sand too, lying in a ſimilar irregular manner, and being poſited upon ſuch places as Gravel, equally points out the

action of water, retreating from the higher grounds, to have been the Cauſe of its ſituation and poſition[1]. What adds confirmation to this is, that where the upper lands conſiſt of a lax friable ſtone, there the ſand lies in the vallies beneath in a greater plenty than uſual; or where the country is an extenſive low-land plain, and the mountains at a great diſtance, there alſo is generally a vaſt quantity of ſand; as is the caſe with thoſe immenſely large ſandy Deſerts in the lower or remote parts of *Africa*, bordering upon the *Mediterranean* ſea; for the water, that formed the mountains in the in-land or higher part of that great Continent, muſt have paſſed over ſuch ſpacious tracts of land in its retreat towards the ſea, that in all probability it would meet, in many places, with ſtrata of a looſe friable kind of ſtone, which it would ſoon ſeparate, tear aſunder, ſhatter to pieces, and at laſt grind down to ſand, and when thus reduced, this matter would be eaſily carried and hurried away by the torrents of deſcending waters to a great

[1] In ſome places indeed what is properly, and ought ſo to be called, *Sand-ſtone*, lies in ſuch a looſe lax manner, even upon the tops of the higheſt mountains, (where their upper parts happen to conſiſt of ſand-ſtone) and in ſome places ſand itſelf lies thus, as at firſt ſight greatly to reſemble the ſand found in the vallies and in the low campaign countries: but there is always a manifeſt difference between them; for the Sand or Sand-ſtone of Mountains is more coarſe than the other, and generally adheres in lumps, and is found in vaſt large ſtrata or beds of equal thickneſs in every part, and regularly divided by horizontal and perpendicular fiſſures, as the ſolid unmoved beds of ſtone, &c. are; whereas the ſand found in the vallies is ſmall and fine, eaſily ſeparates when touched, and is always pitched in unequal ſtreaks, that are commonly thicker in one part than another, and gradually terminate in points towards either end, and is poſited in all the variety of directions that water, flowing over uneven ground, could poſſibly throw it into.

great diſtance from the mountains, and at laſt be naturally left expanded over the low flat countries, or poſited in the bottoms of large and deep vallies; and ſuch from the maps appears to be the ſituation of moſt of the ſandy Deſerts upon the earth.

And I cannot but think that the far greater quantity of what is called *Sea-ſand* was not formed upon the ſhores, where it is now found, but was originally *Land-ſand*, and brought down even from the in-land countries. Thus much is certain, that the rains that fall upon the higher grounds generally come down replete with ſand, and depoſit it in rivers; and rivers, by waſhing away their banks, ſtill receive more ſand; which being carried down by the currents is at laſt diſcharged into the Ocean. And it is very remarkable, that upon a ſandy ſhore there is generally a great load or bar of ſand at the mouths of the rivers, the very place where the ſand, brought down by the river, would naturally ſubſide, not only on account of the ſtream being there broadeſt and leſs ſtrong, but chiefly by reaſon of the oppoſition the river-water would meet with from the waves of the ſea, which would beat back the current of the river, weaken its force, and oblige it to lay down its burthens. So alſo with regard to thoſe immenſe *Sand-Banks* that are found upon ſome ſhores, even where there are no very large rivers immediately adjoining (though they are generally where there are ſuch rivers) it is certainly very reaſonable to conclude, that they are in a great meaſure the product of the diluvian waters;

waters; and had the Sea, after the deluge, retreated farther within its bed, they would have been left upon the low-lands and now found in the form of *ſandy deſerts*; for as the waters of the deluge retreated from the higher lands, tore out and carried away ſuch vaſt quantities of terreſtrial matter (as the hollows of the Combs, Dales, and Vallies over the whole ſurface of the earth abundantly demonſtrate) they would naturally depoſit a great portion of that mixt ſubſtance they were loaded with, eſpecially of the finer and lighter ſort, upon thoſe parts or places where their force firſt began to abate, or the land was of a proper form for receiving and retaining it, and ſuch certainly are thoſe low flat Shores where the principal Sand-banks are found.

Some perſons indeed have imagined that there is a difference between Sea-ſand and Land-ſand; but the ſtricteſt inſpection can diſcover none: and Dr. *Woodward* obſerves, that "The Sand upon the ſhores of *Sheppey* conſiſt of extremely ſmall pebbles of the very ſame kind with thoſe commonly found in ſand-pits at land, in various parts of *England*, particularly in ſeveral parts of *Kent*" (in which County the iſle of *Sheppey* lies). Dr. *Liſter* too remarks (*Phil. Tranſ.* N° 164.) "That the *in-land Sand-hills* above *Bulloigne* in *Picardy* in *France* is of the very ſame kind with that on the *ſea-ſhore* at *Calais*."

So that, upon the whole, we may as fairly conclude, that the granules of Sand were cauſed by a friction of the parts among themſelves in agitated water, as that the pebbles, of which Gravel

vel conſiſts, were; and alſo that the far greater quantity of the Sand now lying upon the ſea-ſhore was not owing to the agitation of the waters of the Sea, but that the origin of *this* and of *all the Land-ſand* is to be attributed to the action of *other waters*: and when we conſider the vaſt extent of the ſeveral *Sandy Deſerts* upon the earth, and the largeneſs of many of the *Sand-banks* upon the ſea-ſhore, and the diſtance of theſe from one another, and how in a manner they are ſcattered over the whole face of the earth, we muſt infer that the Cauſe was as univerſal as the Effects, and therefore that a *flood of waters* has covered the *whole ſurface of the earth.*

II. But beſides theſe Stones that have been thus apparently rounded by water, there *are others that have plainly endured the force of this fluid, though not in ſo great a degree as the above, either on account of their ſize, hardneſs, or the ſhort time they were ſubject to its force, but yet they manifeſtly exhibit marks of its power; and their ſize, number, and ſituation ſufficiently demonſtrate that the action of the water, to which they were ſubject, was univerſal or extended over the whole ſurface of the earth.* For,

There is abundant reaſon for believing, that there are very few hills or mountains, at leaſt ſuch as conſiſt of ſolid ſtrata or hard rock within, but what have ſeparate maſſes of ſtone, ſome of an immenſe bulk, together with ſmaller pieces, lying upon their tops or ſides, and alſo that there are ſuch ſtones in the vallies beneath; and both

the larger and ſmaller maſſes, of all kinds of ſhapes, and lying in all kinds of poſtures, though generally in ſuch a direction, and ſo ſituated, as plainly to indicate that a flood of waters, retreating from higher grounds, was the cauſe of their poſition.

What Mr. *Lhwyd* ſays of *Wales* (*Phil. Tranſ.* N° 334.) I have obſerved to be true, not only in that Country, but in various parts of *England*: "What ſeemed to me moſt ſtrange, were *vaſt confuſed Stones*, and, to appearance, *Fragments of Rocks*, ſtanding on the ſurface of the earth, not only in wide plains, but on the ſummits alſo of the higheſt mountains;" to which he ſubjoins this remark, "There is no Brim-ſtone or Pumice-ſtones on the tops of our mountains, nor any thing elſe that I ſuſpect to have been the effects of *Volcanoes*" [ſo theſe ſtones not to be attributed to ſuch cauſes].

Again; Dr. *Stukeley* (after having cited the above quotation from Mr. *Lhwyd* in his *Abury reſtored*, &c. p. 17.) writes thus: "So [in the ſame manner as the above Stones] lie the *Moor-ſtones* on the waſtes and hill tops of *Cornwall*, *Derbyſhire*, *Devonſhire*, *Yorkſhire*, and other places, of a harder nature than *theſe* [i. e. the *Grey-Weather-ſtones* on the *Marlborough* downs, of which the Doctor is firſt ſpeaking] and much the ſame as the Egyptian Granate." But the Grey-Weather-ſtones themſelves (of which I have ſpoken in part before, p. 283.) are probably as remarkable as any, and as they lie in a part of *England* that is much frequented on account of the great roads

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that are near them, principally one that leads from the ſecond to the firſt City of the kingdom, and are well known to moſt travellers in theſe parts, I ſhall give a particular account of them, to ſave the trouble of being circumſtantial in other relations. Theſe Stones are of a baſtard kind of lighteſt grey marble: and are of various ſizes; ſome of them fifty, ſixty, or even ſeventy ton weight;[m] others ſo ſmall as to weigh but a few pounds. They are ſpread over an irregular ſpace of ground for forty miles in circuit, as I have obſerved myſelf; and have been informed that they extend much farther.[n] They begin at, or thoſe

[m] "But our Grey-Weather-ſtone is of ſo hard a texture, that Mr. AYLOFF of *Wotton-Baſſet* hewed one of them to make a rape-mill ſtone, and employed twenty yoke of oxen to carry it off; yet ſo great was its weight, that it repeatedly broke all his tackle, and he was forced to leave it. Ld. PEMBROKE cauſed ſeveral of theſe ſtones to be dug under, and found them looſe and detached. My Lord computed the general weight of our ſtones at above fifty ton, and that it required an hundred yoke of oxen to draw one. Dr. STEPHEN HALES makes the larger kind of them ſeventy ton." Dr. STUKELEY's *Stonehenge*, p. 6. Some of the largeſt of theſe Stones lie in the bottom of a Comb or Valley called *Grey-weather-bottom*, and are in a great meaſure covered with coppice wood, which muſt be removed; and the Stones carefully ſurveyed on all ſides, in order to ſee their due ſize.

[n] It is certain that theſe Stones were formerly far more numerous than they are at preſent, for many of the Houſes and moſt of the Walls for gardens and encloſures of all the Villages on and near theſe Downs are built of them; and for ſeveral years paſt full liberty has been given to all, that might want them, to take them away (in order that the ground might be ploughed) and vaſt numbers have accordingly been taken off. Then too, the huge Stones of which the two Druidical Temples of *Abury* and *Stonehenge* (the former ſituated on, the other at about the diſtance of ſixteen miles from, the Downs) conſiſt, were brought from theſe Hills and once made a part of the Grey-Weathers, as cannot be doubted when we conſider, that there is no ſtone of the kind of which theſe Temples are

thoſe that are higheſt lie upon, the tops of the greateſt Eminences on theſe Downs, and tend on each ſide in incredible Numbers for ſeveral miles down towards the two nearly oppoſite Seas, the *Engliſh* Channel and the *Briſtol* Channel, and many of them lie in long trains, juſt in ſuch a manner and direction, as water retreating from theſe ridges would naturally have thrown or placed them, as the courſes of the rivers adjoining evidently demonſtrate, they tending theſe two ways; nay, even the rain, that falls perpendicularly upon the earth, parts on the tops of ſeveral of theſe hills, and retreats towards the two abovementioned ſeas; one portion, falling into a branch of the river *Avon*, deſcends to *Briſtol*; and another, entering into the river *Kennet*, (which at ſome diſtance joins with the *Thames*) goes to *London*, and empties itſelf near the Eaſt end of the *Engliſh* Channel; but on the South ſide of theſe downs, the rain that falls retreats into another river called the *Avon*, and runs directly into the very

are built nearer than theſe Downs; nay, that there is no ſtone, that I know of, in all *England* of the ſame kind but thoſe that lie on theſe Downs: which alſo by being ſeparate and detached from any rock, and lying looſe upon the ſurface of the earth, were moſt fit for uſe and ready for carriage: beſides, in the Valley where the biggeſt of theſe Stones lie are now to be ſeen ſeveral great Holes or Cavities in the ground with ſlopes on each ſide, which have been plainly dug, and the chief ſubſtance carried away; and in two or three of theſe Cavities I obſerved a large *Grey-Weather-ſtone* lying, but broken in the middle; and it was very evident, that the earth had been dug away from ſuch Stones, that they might the more eaſily be carried off; but probably, by ſome accident (as the machinery not being ſtrong enough), the Stone in raiſing fell and ſplit aſunder, and then was too ſmall to anſwer the end deſigned, and therefore was left, as not being worth the carriage.

very middle of the *Engliſh* Channel: ſo that theſe Hills are manifeſtly the higheſt land in the South part of *England*, and from them there lies a gentle declination on each ſide towards the neareſt ſeas: which declination (as I have above ſhewn) was cauſed by, or was the natural conſequence of, a flood of waters that formerly covered theſe lands, and retreated from the in-land parts down towards the ſea-coaſts; and as the Stones I am ſpeaking of tend in a courſe anſwerable to the effects of ſuch a flood, we may juſtly ſuppoſe that their preſent poſition and ſituation were owing thereunto. Which will be farther apparent from a more particular conſideration of them. On the tops, and near the ridges of the Hills, there are few, and thoſe ſeparate from each other; but as the diſtance increaſes, they increaſe in number, lying thicker and cloſer, and chiefly in the bottoms of the Combs; and beſides, ſhape and wind their courſe according to the direction of the Combs and Vallies; which clearly ſhews that the Agent that formed the one (the Combs), placed alſo the other (the Stones): and when we loſe ſight of them above ground, they are ſtill to be found underneath, lying among broken flints and gravel, and ſuch as I diſcovered here were much leſs than thoſe that lay upon the ſurface of the earth and higher up in the Vallies, and alſo much more worn, and many of them fairly rounded: all which evidently denotes, that water deſcending from the higheſt eminences on theſe Downs was the cauſe of the poſition, ſituation, and direction of theſe Stones.

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I HAVE obſerved too ſuch maſſes of Stone, as the above, lying not only in in-land countries, but alſo on the *Sea-coaſts*, and many of them ſo large as to conſtitute *Rocks* and ſmall *Iſlands*; and that they were really no more than Fragments broken off, and brought down from the mountains or hills above, was ſufficiently manifeſt, not only from the ſtrata in them being in a different poſition, and of a different kind from the unmoved ſtrata on the ſea-coaſts, but that the neareſt place, where there were any ſtrata of the ſame kind with the fragments, was in the mountains or hills above; and from them there lay ſeparate maſſes of the ſame kind of ſtone, ſome more, ſome leſs worn, in the combs, dales, and vallies, quite down to the ſea-coaſts; where the larger fragments lay, and reſted, as it were, upon the loweſt ground.

AND what is thus obſervable in *England* is to be ſeen alſo in other parts of the world. Mr. *Innes* in his *Miſcellaneous Letters*, &c. (p. 6.) ſpeaking of the pariſh of *Magilligan* in the County of *Londonderry* in *Ireland*, ſays thus, " The Deluge hath left us other marks of its fury, for more than half of our Mountain is one continued Heap of Stones and Rocks tumbled down, and in particular one Rock left ſtanding upon the ſide of the precipice: it is about twenty-eight feet in height, about ſix yards about, with natural ſeams in it, not very well cemented; no art of the *Iriſh* could place it there."

So alſo Mr. *Smith* in his *Antient and Preſent State of the County of Kerry* in that kingdom, p. 82.

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" The moſt conſiderable natural curioſities in this [the Southern] part of the Country are *two Rocks*, on either ſide of the river *Roughty*, [which in this place is about a mile broad] which ſeem to have exchanged their ſituation: one of them the Country-folks name Clough-Bearradh, *i. e.* the ſtone ſlice. This river divides a lime-ſtone ſoil from one of common grit, a thing very frequent in *Ireland*, though but little noticed becauſe of it's being very common. Except the above-mentioned rocks, all the ſtone on one ſide of this river is lime-ſtone, and that on the other is a coarſe grit, or common mountain-ſtone: but oppoſite to each other, on different ſides of the river, a large rock, too heavy for human force to remove, of lime-ſtone, hath ſeated itſelf on the grit-ſtone ſide of the ſtream; and a large rock of grit hath occupied the place from whence the other ſeemed to be detached, and is ſeated among the rocks of lime-ſtone: which is a ſpecies of *Luſus Naturæ*, or ſporting of nature, not very incurious; and which muſt have been effected by ſome prodigious flood, or ſhock of the earth; but earthquakes have been hitherto, 'till of late, quite unknown to this kingdom."

Bishop *Pontoppidan* in his *Hiſtory of Norway*, p. 56. writes thus, " Hence [*i. e.* from the Deluge, as he rightly concludes] likewiſe remain on the ſurface of the earth the many detached blocks and fragments, like lumps of mortar, ſcattered not only in the vallies and creeks, but alſo on the tops of the higheſt mountains; many ſuch being found here of the bulk of a common houſe, con-

ſequently too ponderous to have been raiſed to ſuch a height by the hands of men; and beſides, of no viſible uſe." Again, p. 177, "The higheſt creſt of the mountain of *Svuku* in *Oeſterdalen*, a province of *Norway*, lies, according to a ſurvey taken by the barometer, about two thouſand ells higher than the lake of *Famund*, a water betwixt the mountains. This mount conſiſts of one ſolid hard ſand-ſtone; on the top of the mountain ſtands a ſolid huge maſs of the ſame ſtone, which bears on it many marks of a diſſolution and diſruption, which can be attributed to nothing but water."

Swedenborg in *Acta Literaria Sueciæ* (tranſlated in the *Literary Memoirs* of *Germany*, Vol. I. p. 66.) obſerves thus, "That the Ocean once ſtood high above the Earth ſeems to be more evidently concluded from the face of the Northern parts, than from that of countries more Southerly. Here [in *Sweden*] we find entire tracts filled, as it were paved, with Stones of a huge weight and bulk: and the higher the country lies from the ſea, theſe Stones are larger and more numerous;—as in *Orebo*, which lies high and between two Seas, larger and more numerous Fragments are obſerved than any where elſe."

Langius in his *Preface* to his *Hiſtoria Lapidum*, &c. or *Hiſtory of the figured Stones in Switzerland*, remarks thus, "Then concerning *Stones* this truly wonderful occurs, that the tops of rocks and ſummits of the higheſt mountains are ſometimes divided by joints into ſeparate pieces; and moreover that certain Fragments or large pieces of

of Stone of ſome cubits in height and breadth are found lying upon Plains, and even upon Hills which are at a great diſtance from higher grounds, or ſeparated from them by vallies: now by what means the aforeſaid Diviſions or Separations were produced in the hardeſt Rocks, and how the above-mentioned Fragments of rocks were brought down to the places where they are now found, deſerves, in my opinion, a diligent inquiry: for I can ſcarcely think that they were naturally generated in theſe places, ſince they carry in themſelves evident marks of being really the *Fragments of Rocks, cum veriſſima rupium Fragmenta præſeferant.*"

A PERSON, who attended Sir *Martin Frobiſher* in his ſecond voyage to the *Streights* that paſs under his name, obſerved upon the adjoining land "Huge and monſtrous mountains, whoſe great ſubſtance were Stones, and theſe Stones ſo ſhaken by ſome extraordinary means that one is ſeparated from another, and diſcordant from all other quarries." *Hakluyt*'s 3d. Vol. of *Voyages*, p. 38.

MR. *Ellis* in his Voyage to *Hudſon's-Bay*, &c. p. 147, ſpeaking of an iſland (called *Marble-Iſland*) near the Coaſt of *New North-Wales*, ſays, "The tops of the hills are prodigiouſly rent and ſhattered, numbers of huge Rocks are confuſedly huddled together, as if by an irruption."

Ludolphus, in his Hiſtory of *Ethiopia*, p. 28, deſcribing the Mountains and Rocks in *Habiſſinia*, writes thus, "Amongſt theſe Mountains, and frequently in the Plain itſelf, and in the middle of the fields, riſe up *Rocks* every way ſteep, yet

varying their ſhape; ſome looking afar off like towers, ſome like pyramids, ſome like four-ſquare towers built by art, and ſo even on the ſides as if the workman's hand had done it: ſo that there is no way to get to the top but by the help of ladders and ropes."

UNDER this head may probably be reckoned thoſe two remarkable Rocks or Stones, which front each other, near *Blankemburgh* in *Germany*, and which are called *Monks Craigs*, on account of their reſembling at a diſtance the appearance of *two monks* in their proper habits. *Atlas Geographus*, p. 544.

So alſo I may here mention that large and curious Maſs or Mountain (as it is called) of *Iron Ore* at *Taberg* in *Smalandia*, in *Sweden*, for it can really be no other than an enormous Fragment, torn from the mountains above, as is evident from Dr. *Aſcanius*'s deſcription of it,* which is as follows, "This Mountain is ſituated in a ſandy tract of land, of which the ſand is extremely fine. Oppoſite to it is a valley, through which a ſmall river flows. It's perpendicular height is above four hundred feet; it's circumference half a *Swediſh* league, or three *Engliſh* miles. The whole mountain is one maſs of rich iron ore, and even in ſome parts is mixed with particles of native iron.—There are many perpendicular as alſo horizontal fiſſures all over the mountain, which are filled with the ſame ſand, reduced to a kind of fine mud-like paſte, and in no part whatever is it impregnated with the leaſt particle of the iron ore

* See *Philoſ. Tranſactions*, Vol. XLIX. p. 30. for the year 1756.

ore of the mountain, but is of the ſame purity and nature as is found on the ſea-beaches.—No ore is found beyond the foot of the mountain, nor on the neighbouring plain; ſo that it appears as if the mountain had been artificially laid on the ſand, for it has no roots, or, like other mountains, it's ſubſtance does not penetrate the ground. —It is ſituated near forty *Swediſh* leagues diſtant from the ſea."

ANOTHER Hill or Eminence, that may come under the denomination of a Fragment, is that called *the inacceſſible* or *Needle-mountain* in *Dauphiny* in *France*, as the form and ſituation of it plainly denote. " The poſition of this Hill is ſuch, that it appears to have been inverted or turned upſide down, for it is no more than a thouſand paces in circumference at the bottom, and is two thouſand at top; from whence it is called the *inacceſſible Mountain*.—At the top upon the plain of this hill there is a narrow and ſteep Riſing or a ſharp-pointed Elevation; which gave this hill the name of the *Needle-mountain* (ſee *Hiſtoire de L'Acad. des Sciences*; for the year 1700, p. 4.)" and which probably was the cauſe, why it did not ſettle upon its larger baſis, or the plain at the top.

THE famous *Rock* in *Horeb*, anciently called *Maſſah* or *Meribah*, and at preſent *the Stone of Moſes* and *the Stone of the Fountains* (being that which *Moſes ſtruck with his rod*, in order *to give water to the children of Iſrael in the Wilderneſs*, Exod. xvii.) is preſerved to this day without the leaſt injury from time or accidents, and is cer-

tainly a *Fragment* from mount *Sinai*, as appears from Dr. *Shaw*'s deſcription of it: " It is a Block of Granate marble, about ſix yards ſquare, lying tottering, as it were, and looſe in the middle of the valley [of *Rephidim*], and ſeems to have formerly belonged to mount *Sinai*, which hangs, in a variety of precipices, all over this plain." [p]

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[p] SHAW's *Travels*, p. 352. It may not be unacceptable to the reader, nor altogether foreign to our preſent purpoſe, to continue the Doctor's deſcription of this Rock, which is as follows, " *The waters which guſhed out, and the Stream which flowed withal* (Pſalm lxxviii. 20.) have hollowed acroſs one corner of this rock a Channel about two inches deep, and twenty wide, appearing to be incruſtated all over, like the inſide of a tea-kettle that hath been long in uſe. Beſides ſeveral moſſy productions, that are ſtill preſerved by the dew, we ſee all over this channel a great number of Holes, ſome of them four or five inches deep and one or two in diameter, the lively and demonſtrative Tokens of their having been formerly ſo many Fountains. It likewiſe may be farther obſerved, that Art or Chance could by no means be concerned in the contrivance; for every circumſtance points out to us a Miracle, and, in the ſame manner with the Rent in the Rock of Mount *Calvary* at *Jeruſalem*, never fails to produce a religious ſurprize in all who ſee it." Similar to which is Dr. POCOCKE's Account of this Rock, and alſo that of the *Prefetto's of Egypt*; each of which the reader may ſee inſerted in the *Biſhop* of CLOGHER's *Tranſlation of a MS. Journal from Grand Cairo to Mount Sinai*, &c. p. 34, 2d. Edit.

I may here obſerve too, that, in conſidering this Rock as a *Fragment*, the Miracle of the water's flowing out of it will appear much greater than if it had been in it's natural bed or united to the ſolid orb of the earth; for it is not uncommon, in breaking up or only boring through the regular ſtrata of the earth, to enter into a natural fiſſure, which, communicating with the Abyſs, is always full of water, and when ſuch is broken into, a ſtream of water will immediately iſſue out and continue flowing: but as this Rock was ſeparate and detached from the regular and undiſturbed ſtrata, and lying looſe upon the ſurface of the earth, it cannot be ſuppoſed to have had any communication with the natural fiſſures, and therefore the water that proceeded from it muſt have been owing to a ſupernatural Cauſe; which is agreeable to what an ancient Traveller

THUS I have given inſtances of *large maſſes of Stone* or *Rocks lying looſe upon the ground in various parts of the earth*, and no doubt is to be made but that ſimilar maſſes are to be found in every part, where there is any conſiderable extent of land, though ſuch only are taken notice of by travellers as have ſomething remarkable in their appearance. And that theſe are really no other than *Fragments* torn off, and carried down from higher grounds, every circumſtance in the above deſcriptions tends to point out, as the reader will be a ſufficient judge for himſelf from what has been already ſaid on the ſubject.

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veller (M. BAUMGARTEN, a *German* Nobleman, who travelled into *Arabia* in the year 1507; ſee his Travels in CHURCHILL's *Collection of Voyages*, &c. Vol. I. p. 337.) remarks: "Which Miracle (of the water's flowing out of the above-mentioned Rock) was the more wonderful, becauſe this Stone, though it is ſeparated from the reſt of the rock, and is almoſt of a ſquare figure, yet is fixed in the ground by only one pointed corner [ſee Dr. SHAW's Draught of it in his Travels, p. 350.] and conſequently not in ſo fit a poſture to extract any moiſture from the earth; and therefore it's ſending forth ſuch abundance of water muſt have been the work of an Almighty Hand."

I may here add too, that this Stone was ſo ſmall, expoſed in ſuch a manner, and ſituated in ſuch a tottering condition, that it might eaſily be viewed on all ſides, and even turned upſide down, had the people that attended *Moſes* ſuſpected any cheat or impoſture in this affair; and in order to take off all ſuſpicion of this kind might be one reaſon why GOD made choice of ſuch a Stone as this for the operation of this miracle, which was ſo extraordinary and attended with ſuch indubitable proof, that the perſons, who had juſt before murmured and queſtioned the divine Miſſion of *Moſes*, now entirely acquieſced in it: and if ſuch perſons as *Corah*, *Dathan*, *Abiram*, and *their companies* (who were ready on every occaſion to find fault with *Moſes* and diſpute his Authority) were ſatisfied, ſurely our preſent unbelievers (who lay claim to great modeſty and reaſon) ought to be ſo, ſince the Miracle was examined by their own ſet of people, and they may have ocular demonſtration of the truth of it at this day.

I SHALL therefore in this place only enlarge a little on the afore-cited paſſage of *Langius*, (p. 306.) " That the tops of rocks and ſummits of the higheſt mountains are ſometimes divided by joints into ſeparate pieces;" for though this may ſeem a trifling and inſignificant obſervation, yet the opening or widening of theſe kind of joints was the immediately preceding effect to the tearing off and carrying down of the Fragments, and one was the conſequence of the other, as will be evident from the following particulars. Theſe joints or openings between the ſtones in the upper parts of rocks ought to be diſtinguiſhed from the natural fiſſures in the body of the rock, and are diſtinguiſhable there-from by various marks—being generally far more numerous than the others, commonly filled with ſludge or an earth-like matter, but principally are to be known from the others on account of their greater width in proportion to their length, and becauſe their edges or terminations are much worn and rounded, and alſo the extraneous bodies, ſuch as ſhells, corals, &c. that project from the edges, much worn and rubbed. All which clearly ſhew that theſe edges have been ſubject to ſome gradual attrition, and that theſe joints or openings have been a paſſage for ſome ſuch fluid as water; which alſo muſt have paſſed through them with ſome force or violence, elſe theſe edges (which doubtleſs at firſt, like the ends or terminations of other cracks in ſtone, were ſharp, jagged, or pointed with acute angles) could not have been worn to ſuch a degree; which laſt conſideration farther ſhews, that this

this effect is not to be aſcribed to the ſlow and gentle gleanings of rain through the earth; nor even where the rock is naked and expoſed to all the violence and beating of the wind and rain, are theſe openings to be attributed to them (though probably they may enlarge them a little), for they are found almoſt equal in number and ſize, and have as manifeſt marks of the force of running water, where the rocks are covered with mould and rubble for the depth of ſeveral feet, as where the rocks are expoſed to the weather. And I believe that there are few or no rocks but what have theſe joints or openings made by the action of water, in greater or leſs degree, even under the turf; which is a proof that this effect was produced before the earth was covered with vegetable mould: and ſince theſe marks of the force of water are to be ſeen upon the ſummits of the higheſt mountains and rocks throughout the whole world (for we may reaſonably ſuppoſe, that what is common to the rocks and mountains in *England* and *Switzerland* is common alſo to all other) we muſt conclude, that the water, that opened or enlarged and paſſed through theſe cracks, was equally univerſal with its effects, or ſpread over the whole ſurface of the earth; and therefore the Deluge, in which theſe accidents happened, univerſal.

And as the water made its way through theſe cracks, it would not only wear and widen them, but by continuing and repeating its action would at laſt ſeparate and disjoin large pieces of the rock, and remove them from their places: and accordingly

it

it is common to ſee, in a country that is expoſed and the rocks laid bare, large maſſes of ſtone, ſome diſplaced but two or three inches from their original beds, others two or three feet (and there remaining pendulous at the tops of precipices and brows of hills), others carried down the ſides of mountains and hills for ſeveral yards; but none of them removed to ſuch a diſtance, or ſo much injured in the carriage, but that a judicious perſon may find the very place they formerly occupied in the natural rock, and have as convincing a proof that they are *disjecta membra* or the diſſevered parts of the adjacent rocks, as if he had ſeen them torn from thence. And if he would judge thus of thoſe that lie upon the tops and ſides of mountains, he would certaily determine the ſame of thoſe that lie farther down in vallies; for the former are only the beginning; the latter the end of the ſame train: and as the former were puſhed down or removed out of their places by the force of deſcending water, ſo alſo we muſt conclude of the latter; and that both are proofs that a flood of waters formerly covered, and retreated from, the ſurface of the whole earth.

II. But beſides theſe larger Stones, there are others that are leſs; which alſo are to be *found looſe upon the ſurface of the earth*, or elſe but a little way beneath it; and are of ſuch a nature themſelves, and lie in ſuch a manner, as clearly to point out that they are *Fragments* torn from the ſtrata above, and placed in the form they now lie,

by

by currents of water deſcending from the higher grounds.

Of theſe leſſer fragments there is a great variety, and no country whatever without them. And as it would be endleſs to ſpeak of every different ſpecies, trace out the accidents that have happened to them, and particularize the arguments deducible from each, I ſhall therefore treat only of one ſpecies, which, on account of its uſefulneſs in leading to the diſcoveries of veins of ore, &c. has been accurately ſearched into, and carefully examined, by moſt miners. The ſpecies I mean, are thoſe ſtones which are commonly called *Shoad-ſtones*. An account of which I ſhall take from Mr. *Borlaſe's Natural Hiſtory of Cornwall*, p. 149; as that Author has illuſtrated his meaning by ſome copper-plate cuts, which the reader, if not converſant in the affair, would do well to conſult.

But firſt it will be neceſſary to explain a few terms. A *vein of ore*, or a *fiſſure containing ore*, is called in *Cornwall* a *Lode* or rather *Load*; and I ſuppoſe for this reaſon, becauſe that is the place where the ore *lies*, as if it had been *loaded up* or *laded in*, as goods are in a ſhip. The *top-part* of the Vein or that which is neareſt to the ſurface of the earth, and which generally conſiſts of a mixture of ore, looſe ſtones and rubble, is called the *Broil*. When this Broil, or rather that which was once the Broil, is found diſperſed or lying at any diſtance from the Load, theſe diſperſed or ſeparated parts are called *Shodes* or *Shoad-ſtones*, becauſe, I ſuppoſe, they lie in ſuch a manner as manifeſtly

manifeſtly to ſhew that they were *ſhed* abroad, *ſhot*, or detached from the main Vein or Load; and that this detachment or ſeparation was made by the force of water will appear from the following phænomena, as extracted from the abovementioned Author.

1. "The Broil is found in greater quantity in the vallies than on the tops or ſides of hills; in the level grounds it is but juſt moved from its firſt ſtation, and ſpread on each ſide the vein in an equable manner; but if the lode has any declivity near it, then many of the looſe ſtones of the broil are found ſtrewed down the hill. 2. The longer the declivity, the farther are theſe ſtones removed; but the ſhorter and ſteeper the ſides of the hill are, the leſs diſtant they are found. 3. The ſmaller ſtones are carried fartheſt; on the contrary, the largeſt ſtones are neareſt to the lode. 4. The ſmaller are alſo nearer to the ſurface of the ground, but the larger ones deeper, and ſtill deeper as you approach the lode, 'till the laſt are found contiguous to the lode itſelf. 5. The farther diſtant theſe ſtones are from the lode, the fewer they are in number; but they multiply as you come nearer, and are always in greateſt plenty next the lode. 6. Theſe ſtones are known from all others by their being of a different colour and ſtructure from the ſhelf, rubble, and other common ſtones of the ground where they lie, but more particularly by their angles being worn off; and the farther diſtant they are from the lode, the ſmoother they are; and the nearer, the leſs

are

are their angles blunted. In *Cornwall* we call theſe diſperſed parts of the broil *Shodes*.

FROM daily obſerving the grounds they ſearch, and the different ſubſtances they there meet with, the tinners can readily diſtinguiſh between what has been removed from what has perpetually kept one and the ſame ſtation; the karn, that is the firm ſolid rock, ſeldom affords us any inſtances of alteration or movement, but every looſe unconnected part of the earth has been moved and ſhifted; and foraſmuch as the tranſpoſed bodies are found to be moved more or leſs, farther or leſs diſtant from their former beds, according to their own ſpecific weight, and the declination of the plane they moved on, it is the general perſuaſion of every intelligent tinner, that this change of ſituation can be owing to nothing but *the Force of Water*, and of no other water ſo likely as that of the *univerſal deluge:* neither are we to think this leſs the voice of truth, becauſe it is ſo common an opinion; for indeed the cauſe ſpeaks ſo much for itſelf, that in order to confirm the juſtneſs of this reaſoning, there remains nothing more to do, than to point out the correſpondence and circumſtantial agreement betwixt this aſſigned cauſe and each particular effect and property mentioned before.

FIRST then, in low and level grounds the Broil is greater in quantity, and leſs diſturbed, than on the tops or ſides of hills, as being but juſt moved from its firſt ſettlement by the vacillating waters of the deluge on a plane ſurface; whereas on a declivity, and a more expoſed ſituation, the waters

waters had more power to agitate and diſperſe, and conſequently the original covering of the lode is much leſſened in quantity. 2. The gravitation of theſe ſtones (uſually impregnated with metal) will, when moved with water, make them deſcend a ſteep hill quicker than down a more eaſy deſcent, in the ſame proportion as bodies moved on inclined planes, their velocity being in proportion to their own weight, the declivity on which they move, and the impediments they meet with there; but the quicker they deſcend, the ſooner they get at reſt, and fix by immerging themſelves in the ſtiff clay and rubble, and *vice verſâ*. 3. The ſmaller Shodes were moved to' and fro' eaſily and frequently, and conſequently much diſperſed; whereas the greater and weightier the ſhodes were, the more they reſiſted the agitation of the waters, and were leſs removed. 4. The ſmaller ſhodes are uſually found in and near the ſurface, being waſhed downwards, till, by the reſiſtance of the ground on which they are ſpread, they are forced out like the rills of brooks into open day, whilſt the larger by their ſuperiour weight reſt deeper interred, and nearer the lode. 5. The more diſtant Shodes are found from the lode, the more they were diſperſed by the water, and conſequently became fewer in number in any equal ſpace, like diverging rays; and the nearer to the lode, the thicker and more frequent they remain for the ſame reaſon. 6. That the angles of theſe ſtones are blunted, proceeds evidently from the agitation of water, and they are ſmoothed in proportion to the diſtance they have been rolled;

and

and had the force continued a ſufficient while, theſe ſtones would have been as round as the pebbles on the ſea-ſhore; but the farther we find them from the lode, the more trituration they have undergone, and *vice verſâ*."

III. TOGETHER with the above-mentioned Fragments of Stone, both thoſe of the larger as well as thoſe of the ſmaller kind, both thoſe that are round as well as thoſe of the moſt irregular ſhapes, there is alſo found *a variety of other ſubſtances, lying in ſuch a manner, both with reſpect to themſelves and alſo with regard to the ground they lie upon, as plainly to ſhew that their ſituation and direction were owing to the effects of a flood of water that once covered, and retreated from, the ſurface of the whole earth.*

FOR, *firſt*, it is common to obſerve upon the tops of the higheſt mountains a ſmall thin covering of a kind of blackiſh bituminous earth, commonly known in *England* by the name of *Peat-earth* or *Turf*; and this upon examination appears to be no other than a maſs of rotten and periſhed vegetables [q]. And where the mountains happen to have any extenſive flats or large ſpacious cavities, in form of baſons, at or between their tops, there is generally a ſtill greater quantity of theſe ſubſtances, lying in a moſſy or moraſſy kind of ground, with a vaſt number of trees, of all ſorts and ſizes, buried under them: and many of the trees and vegetables of ſuch ſpecies are not now known

q WOODWARD's *Cat. of Foſſils*, Part II. p. 17. MORTON's *Hiſt. of Northamptonſhire*, p. 83, &c. HALE's *Huſbandry*.

known to be growing near theſe places, nay, ſome of them of ſuch kinds as the barrenneſs of the ſoil or the bleakneſs of the air will not permit to grow there: [r] conſequently, they muſt have been brought from other, far more diſtant, regions; and no Agent or Medium can be thought upon ſo proper for effecting this as *Water*, a Medium upon which theſe bodies would naturally ſwim and float, and therefore be eaſily conveyed from place to place. And the parts they are now found upon plainly ſhew, that their preſent ſituation was owing to a flood of waters that covered the whole ſurface of the earth; for they are left upon ſuch places where ſuch a flood, in its retreat to the lower land, would moſt naturally depoſit a great portion of its floating wealth, viz. upon the higheſt and more eminent parts, or thoſe places which it firſt receded from; in the ſame manner as the water upon the ſea-ſhore in retiring, after an high tide, throws, and by the unequally reciprocal or gradually decreaſing repercuſſive motion of its waves, leaves, upon the parts it firſt recedes from, all lighter bodies or the ſubſtances that ſwam upon its ſurface: and in a ſimilar manner as the ſame water, in retiring from the channels of rivers, bays, &c. leaves upon the banks and ſhores the finer parts of the mud and ſlutch that it was pregnant with; ſo when the flood that drowned the whole earth retreated to its appointed place, it left the ſurface in a manner covered with the fineſt, lighteſt, and pureſt of terreſtrial matter, *Vegetable Mould.*

SECONDLY,

[r] WOODWARD's *Nat. Hiſt. illuſt.* p. 60.

SECONDLY, Under the vegetable mould there lies a vaſt variety of ſubſtances, of all ſorts, ſhapes, and ſizes, but each and all of them placed in ſuch a direction as manifeſtly to indicate, that their poſition and ſituation were the effects of a flood of water retreating from the higher grounds. Thus, for inſtance, where the higher and more inland countries abound with free-ſtone, and chalk, interlined with layers of flint; in the lower lands you will find for the depth of ſeveral feet the two former ſubſtances intimately blended together or waſhed and worn down to a gritty kind of maum, and the nodules of flint broken into innumerable pieces, and confuſedly mixed with the aforementioned matter. In ſuch places where the upper ſtrata of mountains conſiſt of Lime-ſtone, with interjacent layers of clay, and of iron-ſtone, replete with yellow and red oker, or ruddle; in the vallies beneath you may diſcover both large and ſmall, round and irregular, fragments of the iron and lime-ſtone, with unequal and uneven ſtreaks or ſeams of clays, of all colours that the above-mentioned ſubſtances could tinge them with. Where the upper ſtrata conſiſt of a looſe ſand-ſtone, and a brittle flakey ſlate, with beds of clay intervening; in the lower lands you will find for a conſiderable depth a gritty marly rubble, filled with immenſely ſmall pieces of ſharp flakey ſtone, thrown in a variety of poſtures. And the ſame may be obſerved reſpectively and proportionably of all kinds of ſtrata in ſuch places. If we deſcend from the in-land and mountainous countries to the hills and the vallies beneath them,

and examine the manner in which things lie under the vegetable mould, we ſhall find them placed much in the ſame form as thoſe already deſcribed, only a greater quantity and a greater variety of them (according to the different ſpecies of ſtrata that lay between the hills and the mountains) and theſe alſo in general much more worn and much ſmaller, eſpecially thoſe parts that came from the mountains. If we go farther down, and viſit the low-lands and marſhes near the ſea-ſhore, a ſtill greater variety and greater quantity of rubble will preſent itſelf to our view; and the fragments of ſtone much more worn, and in many places ground down to a fine ſand or ſlutch.

Now that this *Rubbly-matter* was placed in the manner above-deſcribed by the action of water, retreating from the higheſt in-land eminences down towards the ſea-ſhore, is evident—from the multitude of ſtones that are found in it which have been apparently worn round by agitation of water;—from the number of fragments of ſtone that lie in trains, tending from the higher towards the lower grounds, juſt in ſuch form and direction as water in it's retreat would naturally caſt them (as I have already ſhewn with reſpect to thoſe ſtones and fragments that lie above ground);—from the irregular and unequal ſtreaks and ſeams into which it is caſt; and what is very remarkable, that in ſuch places where there is any eminent projection in the ground or rock underneath, or large fragments of ſtone which the waters could carry no farther, there theſe ſtreaks

and

and ſeams of different matter are thrown over it in various concentric arches, and the whole terminated in ſuch a form as plainly to indicate that the force of a deſcending flood placed them thus; —and alſo from the manner in which this rubble lies all over the earth; as for inſtance, upon the higheſt in-land eminences, eſpecially ſuch as are ſharp-pointed and ſteep, there is but a ſmall portion of this rubble, ſeldom exceeding a few inches in depth; in the bottoms of the combs that deſcend from theſe eminences you will find the quantity ſomewhat increaſed; in the dales ſtill more; in the vallies a much larger portion; and in the low-land marſhes near the ſea-ſhore a ſtill greater quantity, for two or three hundred feet in depth, and in many places even unfathomable. All which would be the natural reſult of a flood of water, that formerly covered, and retreated from, the ſurface of the whole earth, and deſcended into the ſea, or rather the Abyſs beneath the ſea. For as the in-land parts of the earth were at the greateſt diſtance from thoſe places (the apertures into the abyſs) where the moſt violent force and ſtrongeſt action of the water was, ſo they would be leaſt torn, and of courſe leaſt covered with fragments and rubbiſh; and the wear and tear by the water would be in proportion greater and greater, and the load of looſe rubble gradually and continually increaſed, till it approached the ſea-ſhore; and by the time that the latter waters arrived thither, the ocean would be full or nearly ſo, and therefore theſe waters would be repelled back again, and the looſe clay, mud,

ſlutch, &c. with which they were filled, be cauſed to ſettle upon or near the ſea-ſhore, and ſo conſtitute what we call a *Marſh* or *Moor*, being a looſe clayey ground, conſiſting of a variety of terreſtrial ſubſtances worn extremely ſmall, and placed, in all kinds of direction, as the reciprocal and undulating motion of water would naturally caſt them.

THUS I have ſhewn, from the conſideration of that *vaſt variety of bodies or ſubſtances that are now found looſe upon the ſurface of the earth*, (each particular ſpecies carrying it's particular proof) *that this terreſtrial globe has been covered by an inundation of water.*

I AM now to deduce ſome *Corollaries* from what has been advanced.

1. THEN, from the quantity of matter that is now found looſe at the bottoms of Combs, Dales, and Vallies, and from this matter being principally of the ſame kind with the ſtrata in the ſides of theſe Cavities, we may reaſonably infer that it once made a part of the ſtrata, and ſo, that the ſtrata were once continued from ſide to ſide, and of courſe that the Hollows of Combs, Dales, and Vallies were once filled up with ſtrata ſimilar to thoſe, which now appear in their ſides or in the bodies of the mountains or hills, in which theſe ſuperficial Cavities are: and as mountains and hills are no more than *Eminences* cauſed by the formation of the *Hollows* of Combs, Dales, and Vallies, ſo it is certain that the earth was once of one uniform ſpherical ſurface, and that the preſent irregular mountainous form was not the *original*,

original, but owing to ſome *after-cauſe*, as I have already endeavoured to prove, p. 248, &c.

2. FROM that vaſt quantity of Rubble which in a manner covers the whole ſurface of the earth, chiefly from that which is poſited in Combs, Dales, and Vallies, it is manifeſt that the Hollows of combs and vallies were not cauſed by any *contraction* or *lateral ſhrinking of the ſtrata* (ſee p. 276). For had theſe cavities been owing to ſuch a cauſe, there would have been but little or no looſe matter found in them; for in ſuch a caſe the parts of the ſtrata (when the whole earth began to be conſolidated after it's diſſolution) by being contracted within themſelves, atom to atom, would be ſo cloſely united together, that the Cavities cauſed by theſe Contractions would contain little or no looſe matter in them, as is the caſe with the *covered Fiſſures*, or thoſe Chaſms in the body of the earth which terminate in themſelves and have no Communication with other cracks; in theſe we never find any ſuch looſe matter or rubble as that which lies in the bottoms of dales and vallies: had therefore one ſort of theſe Cavities, as well as the other, been formed by *Contractions*, there would have been like matter found in each and reſpectively placed.

3. FROM the *regular* and *gradually increaſing proportion* of the rubble that is found in Combs, Dales, and Vallies, it is manifeſt that theſe Channels were not cauſed by any elevation and depreſſion of the ſtrata; for had this been the caſe, this rubble would have been placed in the moſt confuſed and irregular manner poſſible.

4. From this ſame increaſe and apparent tendency of this rubble from combs to dales, from dales to vallies, from vallies to the ſhelving bed of the ocean, we may determine the place, whither the other part of this rubble (viz. that which formerly filled up all the Hollows and Channels upon the earth and in the ſea) was carried to, namely, *the Center of the Earth.* For had it been carried no farther than the bed of the ocean, and depoſited there, it would more than have filled that; becauſe the matter that was torn out for making that cavity would equally have filled it when in the form of rubble, as when it remained in whole and unbroken ſtrata: and then there was the additional ſubſtance of all that matter, that before filled up the hollows of the Combs, Dales, and Vallies over the whole ſurface of the earth; and had all this been placed in the baſon of the ſea, it muſt more than have filled it. Now ſince it is certain that all this rubble was carried down into the bed of the Ocean, and as that did not retain it, it muſt therefore have paſſed through, and been carried into ſome place beyond the bottom of the ſea, and that could be no other than the center of the earth, the laſt place it could be driven to; and there it would remain in form of a *nucleus* or *inner globe*, as deſcribed p. 97, 280, and delineated by I. in Plate the *ſecond*.

5. If this load of rubble and fragments of ſtone were carried down to the center of the earth, it will certainly follow, that the Agent that did this, that the *water* (as it is of a more ſubtle and penetrating nature than this matter) accompanied it in

in its paſſage and deſcended together with it; and as this looſe matter occupied the center, the water would naturally ſettle around it, as denoted by G. H. in the above PLATE; and ſo conſtitute the *Moſaic Abyſs*.

6. As in tracing the fragments of ſtone that lie in trains from the mountains, it is common to obſerve where the deſcents are gradual (where they are irregular and attended with ſudden falls and precipices, great irregularity muſt naturally be expected) that thoſe ſtones that are largeſt and leaſt worn lie neareſt the tops, and thoſe that are leſs and moſt worn at the greateſt diſtance, and alſo that theſe Stones are of the ſame kind with the ſtrata in the mountains above, and not of the kind with the ſtrata in the vallies beneath (unleſs where they both happen to be of the ſame ſpecies); ſo it is certain that the currents of water which removed theſe ſtones from their original beds, and placed them in the manner we now find them, came from the mountain-tops and drove towards the ſea, and therefore *that theſe Stones were not thus placed by partial deluges*, owing to high tides or accidental inundations of the ſea, as ſome have imagined; for had either of theſe latter been the cauſe, the larger ſtones would have been left neareſt the lower grounds, and the leſſer neceſſarily thrown higher up: and if the water of ſuch a flood, in its return to the ſea, had force enough to bring back any of theſe bodies, it would naturally leave them in the greateſt irregularity, the leſſer would be brought to the larger, and the ſtones of the vallies be mixed with thoſe of the

mountains; which is not the caſe: and therefore theſe ſtones were not thus placed by ſuch partial floods.

7. FROM the conſideration of ſome other circumſtances attending theſe fragments of ſtone, eſpecially thoſe that have been worn round by water, we may ſee the falſity of another hypotheſis, calculated to ſolve theſe phænomena, without reference to the univerſal Deluge in the time of *Noah*; viz. *that theſe Stones were thus rounded, and the fragments of Rocks torn from their original beds and ſcattered over the ſurface of the earth, at the firſt formation of things, when the earth was totally covered with water, at which time the higheſt mountains conſtituted part of the bottom of the ſea; therefore it is no wonder, ſince the retreat of thoſe waters, that we now find pebbles and rocks in the moſt inland countries.*

BUT the grand queſtion to be ſolved, is, *How came theſe waters to retire?* in which principal particular the Authors of this hypotheſis are not agreed, ſome imagining that the water was rarified and changed into air; others that the Sea by the violent motion of it's flux and reflux threw up vaſt quantities of ſand and mud, and thereby left the ſpaces between them as Vallies, which the water occupying, the eminent parts became dry and habitable; with ſeveral ſuch groundleſs and unphiloſophical aſſertions.

BUT it required, and theſe Authors ſuppoſe it did require, a great length of time, even that of ages, before theſe tranſactions were completed, and therefore that the parts of the earth, which

at

at preſent bear marks of the Sea, conſtituted for a long time the bottom of it, and thereby gave room for the waters to ſeparate the rocks from their natural places, and form the fragments of ſtone into pebbles, and place them in the manner we now find them in the moſt diſtant countries from the ſea.

But then there is a very material difference between the in-land pebbles and rocks and thoſe formed and found at ſea. It is common to obſerve vaſt numbers of pebbles and ſtones upon the ſea-ſhore which have ſeveral extraneous bodies, ſuch as ſhells, corals, and corallines, affixed to their outſides, and many of theſe ſo cloſely adhering that it is almoſt impoſſible to diſengage one from the other without breaking both; and it is alſo certain that theſe grow and are formed at this day, eſpecially in calm and quiet places. But now, after the ſtricteſt examination I could make upon immenſe multitudes of Rocks and rounded ſtones that I have ſeen at land, I never could obſerve any ſuch extraneous bodies adhering to them [s], nay, not upon ſuch as were but a few miles

[s] I have ſeen indeed one or two inſtances of *Nodules* having a ſmall ſhell or a plant ſticking to their outſides; but then theſe are a very different ſpecies of Stones from *in-land pebbles* (though they reſemble them in their outward ſhape) as I have ſhewn p. 291. *Nodules* were formed during the diſſolved ſtate of the earth and the great confuſion of things at that time, and many of them have apparently paſſed through ſeveral ſtrata that abounded with ſhells and plants, and at laſt ſettled in ſtrata that were replete with theſe extraneous bodies, ſo that it is no wonder that we ſometimes find one or two of theſe bodies adhering to their outſides: but *in-land pebbles* were formed at a different time, in a different place, and in a different manner, as may be ſeen in the above cited page.

miles from the ſea, when the pebbles upon the ſea-ſhore abounded with them; which muſt plainly ſhew, that the places where theſe pebbles are now found were never the bottom of the ſea, nor the pebbles themſelves formed at ſea, but that they were made at ſome particular time, or in ſome general deluge, the waters of which muſt have been in ſuch conſtant agitation and perpetual fluctuation, as not to permit ſuch things to ſettle and grow; which is agreeable to the *Moſaic* account of the Flood in the time of *Noah*, ſee p. 93.

And what farther ſhews that the places where theſe Stones are now found were never the bottom of the ſea, nor the Stones themſelves formed at ſea, is, that we never find (what is very common to find at ſea and upon the ſea-ſhore) any *artificial things*, ſuch as regularly-ſhaped pieces of wood, ſtone-inſtruments, iron-tools, potſherds, &c. naturally lying among them, but only ſuch as were placed there by deſign or accidentally dropt, as is evident from the prior diſturbance of the earth, where ſuch have been taken up at any depth, and their being generally found in ſuch places where old Cities, Caſtles, Camps, or Lakes have been [t]. And indeed had theſe artificial things ever

[t] I have read indeed of Boats, ſmall Barques, Anchors of Ships, &c. being found at land in countries far diſtant from the ſea, but then it has generally been in authors of no great credit, and the facts aſſerted upon no good teſtimony; but even allowing them to have been true, it is certainly much more reaſonable to ſuppoſe, that the places where theſe things were found were formerly the bottoms of large *Lakes*, which by deſign or accident had been drained, rather than the *ancient bed* of the Sea; in the ſame

ever been coeval with theſe fragments of ſtones, or ſubject to the agitation of water as they have been, they would certainly have been worn and rounded in the ſame manner as they are. Beſides, the artificial things that are taken up at ſea have indiſcriminately ſhells and corals growing on them, as well as the ſtones and pebbles on the ſhore; but the artificial things, even thoſe that bear the marks of the greateſt antiquity, which are taken up in the inland countries, have no ſuch bodies adhering to them; which is a plain and an undeniable proof, that neither they, nor the places where they are now found, were ever covered by the ſea.

And here, by the way, we have an eaſy and certain method of diſcovering what parts of the earth the ſea might formerly have encroached upon, and covered for any length of time, and after

ſame manner as in draining the famous *Lake* of *Martin-mere* in *Lancaſhire*, which was eighteen miles in circumference, there were found in the ſlutch at the bottom no leſs than eight boats, ſhaped ſomewhat like the Canoes made uſe of in *America*, as Dr. Leigh, in his Hiſtory of that County, aſſures us of his own knowledge, p. 18, and 181. Or elſe theſe things might be attributed to violent tempeſts or accidental overflowings of the Sea; and beſides, whatever things of this nature may be now found at land in *Europe*, ſome allowance muſt be made for the event recorded (p 132) of this treatiſe, when numbers of perſons procured Ships and other conveniences, under apprehenſion of a general Deluge, and probably many of theſe were made at land in countries far diſtant from the Sea, as it was ſuppoſed that the devaſtation would reach all over *Europe:* which therefore, as the event did not happen, would be left in the places where they were firſt made, and in the future ages might be imagined to have been wrecks of ſhips loſt at ſea, though the ſea never reached theſe parts; and what parts of the earth the ſea has really covered will be beſt determined by the marks given in the text, in the ſubſequent pages.

after have retreated there-from, and what not, viz. by obſerving whether the rocks and ſtones, eſpecially the artificial things, found at land, have any marine productions adhering to them or not; if they have none, we may depend upon it the Sea never reached theſe parts; if they have ſome, eſpecially if they are of the ſame kind with the ſhells and corals upon the neareſt ſea-ſhore, we may conclude it has. But upon the ſtricteſt reſearches I could make with regard to theſe particulars, I could never find that the Sea had receded above a few miles in length, or a few yards in depth, from its original and firſt known boundaries; and that only in places where the land was low and flat, and theſe receſſes or retreats chiefly owing to banks thrown up, or canals cut, by the art and labour of man.

ALL Hypotheſes therefore to account for theſe in-land rocks and pebbles (which ſo apparently carry marks of having been moved, ſhuffled, or worn round by water) upon ſuppoſition *that the places where they are now found were formerly the bottom of the ſea*, muſt *fail*, and recourſe can only be had for the explication of theſe phænomena, to the ONE UNIVERSAL DELUGE, in the time of *Noah*.

SOME indeed have queſtioned, whether the Power of Water could poſſibly have cauſed effects ſo great and extenſive as the above-mentioned; but ſuch muſt be very ignorant of the nature and force of that Fluid in it's common operations.

MR.

Mr. *Hutchinſon* (Vol. XII. p. 285.) ſpeaking of the effects of the water retiring at the end of the Deluge, ſays, " The miners antiently were wont to imitate this way of clearing off the earth *by water*. They collected great quantities of rain-water: and, breaking the dams, let fall that water at once, to bear off the earth, ſtone, *&c.* and uncover the veins. The miners call theſe *Huſhes*. —Of theſe there is a larger account in the *Obſervations about the Ores of Metals*.—About the year 1702, being upon *Molds*, a mountain in *Arkendale*, I obſerved a cloud, blacker and deeper than I ever ſaw before, over *Grinton* Liberty. It broke, tore up the plain ground, to five or ſix feet deep in ſeveral places: and channelled the brows and ſides of hills to a vaſtly greater depth; bearing away ſtones of many ton weight, and carrying ſome very large ſeveral hundred yards, unto the plains; bearing down ſeveral little houſes, and making great havock. There was little wind attended this ſhower. Indeed, we ſeldom obſerve much wind with a ſudden great fall of rain." [So the whole devaſtation was owing to the force of water.] Many ſuch inſtances will readily occur to the memory of any one that has been converſant in *Philoſophical Hiſtories*.

But *Swedenborgh* has brought this affair to a mathematical exactneſs, *Literary Memoirs of Germany*, Vol. I. p. 66. &c. " That the ocean ſtood high above our earth, ſeems to be more evidently concluded from the face of the Northern parts [he is ſpeaking of *Sweden*] than from that of countries more Southerly. Here we find entire

tracts

tracts filled, and, as it were, paved with ſtones of a huge bulk and weight: and the higher the country lies from the ſea, theſe ſtones are larger and more numerous. That ſtones of a great weight may be rolled and carried to a great diſtance, appears from the following Hydroſtatical Conſiderations. 1. The weight of ſtone to water, bulk for bulk, is no more than two and an half to one, and to ſalt-water ſtill leſs. 2. Beſides, it almoſt loſes half it's weight in water; and there remains but one and a half. 3. Whence the weight of ſtone is not ſo ſenſible in the Sea as in the Air, ſeeing water is ſo heavy as almoſt to equal part of the remaining weight, that is, the weight of ſtone in water is to water as one and a half to one. 4. If, therefore, the waves agitate the ſea at it's bottom, as tempeſts do the atmoſphere in it's lower parts where we live; and if a column of ſea-water be ſome hundred yards high, the motion and force of the fluctuating water at the bottom will be increaſed in the ratio of the height and of the baſes: ſo that a wave of the ſea, continued towards the bottom, has a greater force from it's height than the ſame wave on the ſurface. 5. And conſequently, the primæval ſea could have carried along with it ſtones of a huge bulk, looſened ſpontaneouſly from mountains, and ſtrew the earth up and down with them, and even move it's whole bottom." This laſt ſuppoſition, that the bottom of the ocean is equally agitated in a ſtorm with the ſurface is a miſtake. Mr. *Boyle* in his *Philoſophical Works*, (Vol. III. p. 239.) has ſhewn,

ſhewn, that the bottom parts of the ſea are *quite calm*; and inſtances in particular in the caſe of a diver, who could ſtay ſeveral hours under water at the depth of fifteen fathoms, and when there, could not feel any motion of the water, though a ſtorm toſſed the waves at the ſurface ſix or ſeven feet high. So that this recourſe to the waters of the *primæval ſea* (in the ſenſe of this and many other authors, as before obſerved) for producing the above phænomena can never avail, and refe-rence can only be had to the waters of the De-luge, when the *Earth* was *broken through* or *per-forated* in many parts, eſpecially *at the bottom of the Ocean*, for the deſcent of theſe waters: and then every effect that *Swedenborgh* has mentioned would naturally follow, but upon no other ſup-poſition.

III.

FROM the conſideration of things upon the ſur-face of the earth let us now deſcend into the *in-ſide*, and ſee what proofs we can educe from thence of an UNIVERSAL FLOOD.

AND here let us enter the ſubterranean King-dom by thoſe eaſy and convenient paſſages,—the *natural Caves* and *Holes* of the Earth: and in the firſt place collect what evidence we can for the point in queſtion from theſe Caves themſelves.

ALL the natural Caverns that I have ſeen my-ſelf, or thoſe that I have read deſcriptions of, ap-pear to me to be no other than what in the *North* of *England* are called *Swallows*, and in the *Weſt*

Swallet-

Swallet-holes. Theſe Holes or Caves are generally nearly circular at top, and from *twenty* to *two hundred yards* or more in circumference. Many of them have a direct perpendicular deſcent, like the Hollow of a Well, for the depth of ſeveral fathoms; in others the deſcent is ſomewhat winding and crooked; and generally, at a greater or leſs diſtance, there is a large ſpacious Opening, into which enter ſeveral leſſer Caves or Conduits; ſome gently declining from the top, others lying in an horizontal line, and ſome deſcending perpendicularly downright to unfathomable depths. The Entrance or Mouth leading into many of theſe Caverns is *at preſent* horizontal and very ſmall; and hence Naturaliſts have been greatly puzzled about the vaſt Spaces within, and how it came to paſs that ſuch ſmall orifices ſhould lead to ſuch ſpacious Openings; whereas in fact the larger Cavities were made firſt, and the leſſer that proceed from them after: and the true entrance into ſuch Caverns is at top, upon the ſurface of the earth, and only covered with rubble and mould; and indeed the large Spaces within, in moſt of theſe Caverns, reach near to the ſurface and form part of the true and original entrance; ſo that they all may be looked upon as *Swallets*, or *in-land gulphs* that *ſwallowed* down the waters of the deluge.

HAVING thus far explained myſelf, I ſhall now ſhew in what various parts of the earth, and how diſtant from each other, theſe Caverns are to be found.

THE

THE firſt that I ſhall mention, and the moſt noted in *England*, is that called *Elden-hole*, in *Derbyſhire*. This is a direct perpendicular Chaſm, of an oblong form, as far as the eye can diſcern it's depth; the mouth of it is about *twenty yards* over one way, and *eight* the other. Mr. *Cotton* endeavoured to find the bottom by plumbing it with a line *eight hundred and eighty-four yards* long, but could not reach it: and upon examining the lower end of the line, he found that *eighty yards* of it had ſunk through Water.[u] Another gentleman let down a line *nine hundred and thirty-three yards*, without meeting with the bottom.[w] The Earl of *Leiceſter*, in Queen *Elizabeth*'s days, cauſed a man to be let down with a baſket of ſtones tied to his middle, in order that by letting ſome of them occaſionally fall he might judge of the depth of the Cave, and after he had remained at the length of a rope of *two hundred ells* for ſome time, was pulled up, in expectation of ſome great diſcoveries: but when he came up he was ſenſeleſs, and died of a phrenſy in *eight days*.[x] When I was upon the ſpot, I found, upon enquiry, that two men had lately ventured down this cavity, upon ſuppoſition that ſome cattle, that had been miſſing, might have fallen into it: and when they had deſcended to the depth of *ſeventy yards*, they found the carcaſes of ſeveral oxen and ſheep; but could get no farther; theſe carcaſes, together with the ſtones that had been thrown in by the curi-

[u] See *The Wonders of the Peake*, p. 40.
[w] *Philoſ. Tranſ.* N°. 2.
[x] HOBBES *de Mirabilibus Pecci.*

ous in endeavouring to diſcover it's depth, having probably covered and ſtopped up the leading Cavity. They ſaid alſo, that after they had been let down about half way, the cavern opens and widens into a ſpacious vault, and that there appeared to to be another great cavity, beſides that of *Elden-hole*, leading to the ſurface of the earth. And upon examination, I obſerved that, at about the diſtance of *two hundred yards* from *Elden-hole*, there was a gradual, nearly circular, Sinking in the earth, near *three hundred yards* in circumference, and from it's utmoſt ſummit about *twenty yards* deep: and this appeared to me to be undeniably the true mouth of *this Swallow*, and that *Elden-hole* is no more than a lateral conduit leading into it.

Three miles Northward of *Elden* is another famous Cavity, called *Peak-hole*, ſituated almoſt in the Village of *Caſtleton*, and at the foot of a ſemi-circular or rather ſemi-cylindrical Rock, (the hollow ſide facing you as you enter) above *two hundred feet* high, and the diameter of the cylinder about *ſixty feet*; at the bottom of this perpendicularly-hollowed rock, this Cavern opens it's mouth in form of an arch at leaſt *forty feet* high, and *ſixty* broad at the bottom;[y] the top part, and the ſides of this arch, as alſo the whole ſemi-cylindrical rock above, are very ſmooth, and apparently worn away by the gradual attrition of ſome ſuch Agent as water; and had not one ſide of

[y] If the reader has not ſeen the place, he may have a juſt idea of it from N° VIII. of Mr. SMITH's *Prints* of the proſpects in the mountainous parts of *Derbyſhire*, &c.

of this tubular Hollow been broken down and carried away by the Agent that firſt formed this perpendicular Channel, it had reſembled at the top and in the inſide a common well, and at firſt ſight would have been eſteemed a *Swallet-hole*; and the not attending to this particular has cauſed great perplexity in accounting for the origin of this Cave. From the mouth of this Hole to the diſtance of *one hundred yards* the roof gradually declines, till you are obliged to bend and creep in order to proceed forward, and after you have crept a little way, you enter into a ſpacious wide apartment; which continues for about *thirty yards*, when the rock almoſt cloſes again, and after you have paſſed (in a little boat) a river that runs through the Cave, the rock widens again into a ſtill greater Opening, till you come to a ſecond ſtream of water, where it again contracts itſelf; but as ſoon as you have paſſed this Current, another ſpacious Opening preſents itſelf, which continues in ſome places higher, in others wider, till the roof of the rock lies upon the very ſurface of a third Current of water, and puts an end to the traveller's journey; but by agitating this water with our feet, we heard a rumbling undulating noiſe in ſome great cavern beyond. From the entrance to the end of this Cave is about *ſeven hundred yards*. Where the larger Openings were, there were ſeveral leſſer lateral Cavities or rather Conduits, and ſome that deſcended perpendicularly down from the top, and the ſides of all, both large and ſmall, are worn as ſmooth and as round, or rather tubular, as a conſtant paſſage of

water could poſſibly wear them: and as this Agent would exert itſelf ſtronger and make more room for itſelf where the greater number of ſtreams met, hence it is that, where the Conduits for the water appear to be larger and more numerous, there the Openings within are wider and more ſpacious; and where there appear to have been but one or two paſſages for the water, and thoſe ſmall, there the Cavities are proportionably leſs. Not that I would ſuppoſe that the water tore theſe paſſages through the ſolid rock without any prior opening or fiſſure: no; there were proper cracks and chaſms made for it's deſcent before, as I have ſhewn, p. 89, 276, &c. But where theſe cracks were larger than in other places, there the water would deſcend in a fuller body and with greater impetuoſity, and would work and wind it's way through leſſer cracks to get into the greater Cavities, and by it's frequent paſſages through both ſorts of theſe Channels would wear and tear away the rock to a great degree, and ſo vaſtly widen the original openings. And as theſe original Cracks would naturally be irregular, according to the grain or different conſtitution of the ſtone or ſtrata in which they were formed, ſo theſe irregularities, when opened and widened by the paſſage of the water, would produce the riſings and fallings in this and ſuch-like Caverns.

I HAVE been longer in deſcribing and accounting for the origin of this Cave than I need be with reſpect to any other, for though there are ſcarcely two that are exactly alike in every thing, yet

yet there are none, that I have ſeen, but what agree in the chief and principal particulars. Thus, at about the diſtance of *eight miles* South-Weſt from *Peak-hole*, there is another ſimilar Cavity known by the name of *Poole's-hole* (not far from the village of *Buxton*) about *ſix hundred yards* in length. In this alſo there are ſeveral riſings and fallings, ſeveral leſſer and larger Openings, with collateral conduits, and the ſides of the rock in all much worn, and in many places greatly torn, as appears from the large fragments that lie looſe at the bottom. The three above deſcribed Caverns are indeed juſtly eſteemed the principal in this County, but there are many that are leſs, and equally demonſtrative of the opinion I have advanced; and there are ſtill a greater number that are, in a manner, undiſcovered; for though they cannot be entered and examined, yet theſe entrances or orifices are very viſible, and are eaſily diſtinguiſhable from the mouths of the pits from whence they dig ore; for theſe latter have generally a heap of rubbiſh thrown out all around them, and deſcend perpendicularly downright, whereas the *Swallet-holes* have no ſuch matter round them, but the rubbiſh lies in the bottom, and there is commonly a gradual inclination or ſeeming ſinking in of the earth that leads to them. It is not unuſual for miners in tracing veins of ore to open ſome of theſe concealed Cavities, and when they do ſo, they generally find as large Caverns within them as either of the above deſcribed. This Country indeed abounds with theſe *covered Swallows* (as they are called) eſpecially

upon the *moor-lands*, and I have ſeen ſome of the extenſive flats there ſo perforated with them, that the face of the earth reſembled, (comparatively ſpeaking) a Sieve.

I HAVE alſo ſeen ſeveral ſuch upon the Mountains in *Wales*, eſpecially upon thoſe above *Tenby* in *Pembrokeſhire*, and vaſt numbers of them upon *Mendip-hills* in *Somerſetſhire*, particularly in *Charterhouſe-liberty* and near *Green-ore Farm*; and *Ookey-hole*, which is about *four miles* diſtant from the laſt mentioned place (of which and of ſome other Caverns near it there is a particular account in *Philoſ. Tranſ.* N° 2.) is evidently no other than a *Swallet* itſelf; as alſo are the *Caves* lately diſcovered at *Lockſton* and *Banwell*, about *twelve miles* to the North-Weſt of *Ookey*; all theſe being in every material circumſtance exactly ſimilar to thoſe I have already deſcribed.

THERE are alſo a few of theſe *Swallet-holes* in and near St. *Vincent*'s Rocks, about *two miles* diſtant from *Briſtol*; and *Penpark-hole* (of which the reader may ſee a deſcription, and a cut repreſenting the inſide of it, in N° 143, of *Philoſ. Tranſ.*) which is about *four miles* Northward from the aforeſaid Rocks, is manifeſtly no other.

OF the ſame kind is the Cavern mentioned by Sir *Robert Atkyns*, in his *Ancient and preſent State of Glouceſterſhire*, p. 230, to have been diſcovered at *Cold-Aſhton*, *ten miles* to the Eaſt of *Penpark* (which upon enquiry, I found has been ſince ſtopped up), the deſcription of which is ſo natural that it is worth reciting; " As a perſon was plowing with oxen, one of the oxen faltered in a hole,

a hole, which, when the earth was removed from it, appeared like to the Tunnel of a Chimney; through which ſeveral perſons have been let down; where they found a Cavity, in which one might walk *above half a mile* one way, and it is not known how far the other: and as they walked with candles, they obſerved ſeveral *ſuch Tunnels aſcending* towards the ſurface of the earth."

An ingenious gentleman, in giving an account of his Journey over *Croſs-fell* Mountain in *Cumberland* (which is part of that immenſe ridge of mountains that reach from *Derbyſhire* to *Scotland*, and are called the *Britiſh Alps*) writes thus: "The *Swallows*, thoſe inconteſtable remains of *Noah*'s Deluge, begin here [on *Roderic* heights] to be very frequent. Some of theſe are *thirty* or *forty yards* in diameter, and near as much deep, perfectly circular, but contain no water at any ſeaſon, the ground having gradually fallen in at the ſinking of the waters; but where they happened amid rocks, the holes are left open to incredible depths." The ſame Author ſays, "That on the top of the ſame [*Roderic*] heights is a pretty large Lake, called *Greencaſtle-loch*, which receives no viſible feeder, but emits a ſmall ſtream Northward to the ſaid burn;"[z] and this in all probability is no other than the mouth of a large *Swallet*.

Another gentleman gives the following deſcription of *Ingleborough* Mountain in the Weſt-riding of *Yorkſhire*;[a] which as it contains, not only an

[z] *Gent. Mag.* for Auguſt, 1747.
[a] *Gent. Mag.* for March, 1761. This Mountain is reckoned to be

an account of *Swallet-holes*, but alſo ſome other particulars relative to the ſubject I have been treating of, I ſhall inſert it at large. " This mountain is ſingularly eminent, whether you regard its height, or the immenſe baſe upon which it ſtands. It is near *twenty miles* in circumference. In this mountain riſe conſiderable ſtreams, which at length fall into the *Iriſh Sea*. The land round the bottom is fine fruitful paſture, interſperſed with many acres of lime-ſtone rocks. As you aſcend the mountain, the land is more barren, and under the ſurface is peat-moſs, in many places *two* or *three yards* deep, which the country people cut up, and dry for burning, inſtead of coal. As the mountain riſes, it becomes more rugged and perpendicular, a d is at length ſo ſteep that it cannot be aſcended without great difficulty, and in ſome places not at all. In many parts there are fine quarries of ſlate, which the neighbouring inhabitants uſe to cover their houſes; there are alſo many looſe ſtones, but no lime-ſtones; yet, near the baſe no ſtones but lime-ſtones are to be found. The looſe ſtones near the ſummit the people call *greet-ſtone*. The foot of the mountain abounds with fine ſprings on every ſide, and on the weſt-ſide there is a very remarkable ſpring near the ſummit. The top is very level, but ſo dry and barren that it affords little graſs, the rock being but barely covered with earth.

be one of the higheſt in *England*, according to an old ſaying in the North,

Pendle-hill, *Penigent*, and *Ingleborough*
Are the higheſt Hills all *England* thorough.

earth. It is ſaid to be about a mile in circumference. There are likewiſe diſcoverable a great many other mountains in *Weſtmoreland* and *Cumberland*, as alſo the town of *Lancaſter*, from which it is diſtant about *twenty* miles. The weſt and north ſides are moſt ſteep and rocky; there is one part to the ſouth, where you may aſcend on horſeback; but whether the work of nature or of art, I cannot ſay. A part of the ſaid mountain juts out to the north-eaſt near a mile, but ſomewhat below the ſummit; this part is called *Park-fell*; another part juts out in the ſame manner, near a mile, towards the eaſt, and is called *Simon-fell*; there is likewiſe another part towards the ſouth, called *Little Ingleborough*; the ſummits of all which are much lower than the top of the mountain itſelf. Near the baſe there are holes or chaſms, called *Swallows*, ſuppoſed to be the remains of *Noah*'s deluge; they are among the lime-ſtone rocks, and are open to an incredible depth. The ſprings towards the eaſt all come together, and fall into one of theſe ſwallows, or holes, called *Allan Pott*; and after paſſing under the earth about a mile, they burſt out again, and flow into the river *Ribble*, whoſe head or ſpring is but a little farther up the valley. The depth of this ſwallow, or hole, could never be aſcertained; it is about *twenty poles* in circumference, not perfectly circular, but rather oval. In wet foggy weather, it ſends out a ſmoak or miſt, which may be ſeen a conſiderable diſtance. Not far from this hole, nearly north, is another hole, which may be eaſily deſcended. In ſome

places

places the roof is *four* or *five yards* high, and it's width is the ſame; in other places not above a yard; and was it not for the run of water, it is not to be known how far you might walk, by the help of a candle or other light. There is likewiſe another hole, or chaſm, a little weſt from the other two, which cannot be deſcended without difficulty: you are no ſooner entered than you have a ſubterraneous paſſage, ſometimes wide and ſpacious, ſometimes ſo narrow you are obliged to make uſe of both hands as well as feet to crawl a conſiderable way; and as I was informed, ſome perſons have gone ſeveral hundred yards, and might have gone much farther, durſt they have ventured. There are a great many more holes, or caverns, well worth the notice of a traveller: ſome dry, ſome having a continual run of water; ſuch as *Blackſide Cove*, *Sir William's Cove*, *Atkinſon's Chamber*, &c. all whoſe curioſities are more than I can deſcribe. There is likewiſe, partly ſouth-eaſt, a ſmall rivulet, which falls into a place conſiderably deep, called *Long-Kin*; there is likewiſe another ſwallow, or hole, called *Johnſon's Jacket-hole*, a place reſembling a funnel in ſhape, but vaſtly deep; a ſtone being thrown into it makes a rumbling noiſe, and may be heard a conſiderable time; there is alſo another, called *Gaper-Gill*, into which a good many ſprings fall in one ſtream, and, after a ſubterraneous paſſage of upwards of a mile, break out again, and wind through *Clapham*; then, after a winding courſe of ſeveral miles, this ſtream joins the river *Lon* or *Lune*; and, paſſing by the town of *Lancaſter*, it

it falls into the *Iriſh Sea:* there are likewiſe, both on the weſt and north ſides, a great many ſprings, which all fall into ſuch cavities, and burſting out again, towards the baſe of the ſaid mountain, fall likewiſe into the *Iriſh Sea*, by the town of *Lancaſter*; and what ſeemed very remarkable to me, there was not one rivulet running from the baſe of the mountain, that had not a conſiderable ſubterraneous paſſage. All the ſprings aroſe towards the ſummit, amongſt the *greet-ſtones*, and ſunk or fell into ſome hole, as ſoon as they deſcended to the lime-ſtone rocks; where, paſſing under ground for ſome way, they burſt out again towards the baſe. There is likewiſe to the weſt and north a great many ſwallows or holes, ſome vaſtly deep and frightful, others more ſhallow, all aſtoniſhing, with a long range of the moſt beautiful rocks that ever adorned a proſpect, riſing in a manner perpendicular up to an immenſe height."

BEFORE I proceed to ſhew, that theſe *Swallet-holes* are to be found in other parts of the world than *England*, it may be proper to ſubjoin ſome other particulars (which could not well be reduced under the foregoing heads without breaking the narrative too much) which will ſerve farther to prove, that *theſe Cavities were formed by the paſſage of water.*

FIRST then, it is common to obſerve in Caverns of this kind, where the Rock contains any extraneous foſſils, ſuch as ſhells, corals, bones, &c. that theſe extraneous ſubſtances are all worn ſmooth and ſhaped to the form of the rock. Now

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it is certain that theſe bodies have naturally a determinate figure, each different from the other, and all diverſe from what we can ſuppoſe the inſide of a rock to be; and when we ſee that parts only of theſe bodies remain in the rock, here an half, there a quarter, and in another place a third part, and theſe remaining portions, not of their natural figures, but ſhaped and curved according to the concavity of the rock, it is manifeſt that ſome external force hath carried away the deficient parts; and when we conſider the regular ſmoothneſs of the rock, and the gradual wear or attrition that theſe bodies have apparently undergone, we can attribute this work to no other agent than water; and though in theſe caverns there are generally drainings and droppings of this fluid, yet the motion of it in this caſe is ſo ſlow and the quantity ſo ſmall, that the above-mentioned effects can never be aſcribed to it; nay, I have obſerved the above-mentioned phænomena in *covered Swallets*, and even near the mouths of them, when the mouths themſelves had been covered for the depth of ſeveral feet with rubble, and yet none of the rubble in the inſide of the *Swallet-holes*, ſo that the wear and tear of theſe extraneous bodies could never have been owing to the ſluggiſh motion of the drainings of water from the ſurface of the earth. And beſides, theſe bodies themſelves exhibit full proof that the water paſſed through the concavities in which they are with vaſt violence and impetuoſity; for it is common to obſerve in the *natural* and *unworn* fiſſures of the earth (where the rock happens to contain extraneous bodies)

part

part of a ſhell or of a branch of coral ſticking in the rock on one ſide of a fiſſure, and the other part of the ſame ſhell or coral on the oppoſite ſide, ſo that it is plain that no force has been here uſed beſides that which made the original crack: but, on the contrary, in *Swallet-holes* I have often ſeen part of a large ſhell or the ſtem of a ſpreading branch of Coral on one ſide of the cavity, and no appearance of any ſimilar ſubſtance on the other; ſo that it is undeniable, that the original fiſſure has been torn, widened, and the rock carried away; the whole face of the cavity pointing out that Water was the Agent, which therefore muſt have paſſed through with great force and violence.

ANOTHER proof that theſe Caverns were formed by water, or, that rapid currents of that fluid have paſſed through them, may be drawn from the multitude of *in-land pebbles* that are to be found in moſt of them. That theſe pebbles obtained their ſhape by being agitated in water, and that wherever they are now naturally found, water has been, I have already ſhewn at large, (p. 287.) and that this water paſſed through the caverns in a full body, and brought down with it vaſt quantities of theſe pebbles, is evident from hence, that they are not only to be found at the bottoms or in the lower parts of theſe caves, but even high up in the niches and covered cavities in the ſides, and many of theſe pebbles conſiſt of a different kind of ſtone from that of the rock of the cavern, ſo that they muſt have came from far, and the ſtreams that brought them been rapid and ſtrong.

ANOTHER

ANOTHER material circumſtance, evincing that theſe Swallows were made by water, is, that where great numbers of them occur together, reaching over perhaps an extent of land of ſome miles in circumference, there the land is nearly level and flat, without any of the diviſions or breaks in the earth cauſed by Combs and Dales; and the reaſon is plain, for the water, that would otherwiſe have torn the ground into gills and dales, paſſed off through theſe Swallet-holes, and ſo tore inward and ſubterranean Cavities, inſtead of outward and ſuperficial Hollows. This, I ſay, is the caſe where vaſt numbers of theſe holes happen to be near each other, but where there are few, not more than *three* or *four*, and thoſe very large, and ſo cloſe together as to make but one, and no ſwallows near them for the ſpace of ſeveral miles, there I have obſerved *two* or *three* ſmall Combs, running in different, almoſt oppoſite, direction, and meeting in the mouth of the Swallet as in a center. And the reaſon of this is equally clear for the point in queſtion. For there being here a natural drain for the waters, and that a very large one, and no other ſimilar cavity near it, not only the waters that were immediately over this hole, but even thoſe that were at a diſtance, would ruſh towards it, and in their acceſs wear and tear the ground into gulleys and combs, and leave the preſent ſtanding marks of it's courſe and agency. And wherever we ſee *three* or *four* combs terminating, from oppoſite ſides, in a point, and a deep ſinking in the earth in the center, we may depend upon it there was a Swallet-hole; and this

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I have frequently obſerved to have been the caſe in a low wet marſhy bottom, or where there has been a ſmall lake or natural pond. And from the deſcription that I have already given of *Lakes*, (p. 228, &c.) we may conclude that moſt, if not all of them, were originally *Swallet-holes*, and alſo that the Cavities of the *Whirlpools*, *Under-currents*, and *Gulphs*, treated of p. 220, &c. were the ſame, and therefore that theſe holes are to be found all over the face of the earth, and of courſe the water that paſſed through them muſt have been equally extenſive.

But beſides what I have already ſaid, to ſhew the extenſiveneſs of theſe effects, I may alſo add ſome other accounts from different countries.

Mr. *Smith* in his *Ancient and preſent State of the County of Kerry in Ireland*, p. 122. ſpeaks "of a large and deep Hole, filled with water, called the *Devil's punch-bowl*, on the Weſt-ſide of the mountains called the *Reeks*;" which certainly can be no other than a Swallow; and the caves mentioned p. 167, are of the ſame ſort, "All the lands about *Killeene* are good lime-ſtone grounds, having in ſome places *conſiderable Caverns*; a thing not uncommon in ſuch kinds of Soil:" Which laſt obſervation is ſo true that I ſcarce ever ſaw a lime-ſtone country but what abounded with Swallet-holes. In the county of *Kilkenny* is the famous Cave of *Donmore*, near *Donmore Houſe*, which has ſeveral large irregular cavities in it, reſembling thoſe in the *Peak*, and is above *a quarter of a mile* long.[b]

In

[b] *Britiſh Mag.* for *March*, 1763. p. 130.

In *France*, at a place called *Roufignac*, about *five Leagues* from *Perigueux*, is a Cavern called *Grandville's Hole*, which has ſeveral *deep cavities*, *collateral conduits*, and *circular holes* in the vaulted roof, riſing like *regular cupolas*, ſimilar to thoſe in *Ookey* and in the *Peak-holes*. [c]

Bishop *Pontoppidan*, in his hiſtory of *Norway*, p. 47, deſcribes a rock or mountain, " that has an aperture in it paſſable throughout, *one hundred and fifty ells* in height, and *three hundred* in length;" and p. 49, 50, he mentions other caves, " in ſome of which he obſerved ſmooth beds of little ſtones or a gravelly bottom."

Dr. *Behrens* in his *Natural Hiſtory of Hartz-foreſt, in Germany*, gives a full and particular account of a great number of *Caverns* that are to be found there; and from the deſcription it appears, that there is ſuch a ſimilarity between them and thoſe found in *England*, that no doubt can be made that they were all owing to the ſame origin, or formed by the ſame means.

In the *Philoſ. Tranſ.* (N°. 109, and N°. 191) there is a long account of a *little Sea* or rather a *large Lake*, called the *Zirchnitzer-Sea* in *Carniola*, in the South-Eaſt part of *Germany*; the water of which retires under-ground through ſeveral great holes at the bottom of it, once every year, and then theſe holes are viſible, " Which are in the ſhape of baſons or cauldrons, the breadth of them being from *twenty* to *ſixty cubits* more or leſs; and the depth from *eight* to *twenty cubits*; and in the bottom of them are ſeveral leſſer holes." " And beſides

[c] *Gent. Mag.* for 1748, p. 581, tranſlated from the *French*.

beſides theſe, there are alſo diverſe *Caverns* and deep places in this Country, even where there is no water; particularly in the mountain called *Javorrick*, near this lake, there are two Holes or *exceeding deep Precipices*, in which many thouſand wild pigeons rooſt all the winter; and on the top of this Hill is a Hole of an unknown depth, out of which there often proceed noxious ſteams: and on another mountain are two great and terrible ſtony caves which, though far diſtant from each other, have yet the ſame effect, viz. when it thunders and lightens, do emit water with an incredible force. Near this lake is the natural grotto *Podpetſchio*, with *ſeveral channels* in it, running diverſe ways, and all the channels are formed in a very hard rock, and are *ſmooth* or *poliſhed* as if cut by men's hands." And the Author ſhews from ſeveral phænomena, that the country is cavernous for ſeveral miles in extent, and though water paſſes through ſome of theſe caverns at preſent, yet it does not through all, though all have marks of it's force.

In the ſame collection of tracts, N°. 266. we have the following account of a *deep Pit*; which from the deſcription appears evidently to be a *Swallet-hole*.

" At ſome leagues diſtance from *Gottenburgh* in *Sweden*, that river ruſhes down from a prodigious high precipice into a deep *pit* with á terrible noiſe, and ſuch a mighty force, that the maſts (which are floated down this river to *Gottenburgh*) uſually turn topſy-turvey in their fall, and do often fly to pieces when daſhed againſt the ſurface

of the water in the *pit*. This occurs if the maſt fall ſide-ways upon the water; but if the maſt fall end-ways, they dive ſo far under water that (according to my information) they riſe not again for a quarter of an hour; others half an hour; ſeveral three quarters of an hour, and ſome a whole hour and upwards. The *lake* or *pit* into which they fall has been often ſounded with a line of ſome *hundred fathoms* long, but never could they find any ground."

MAUNDRELL in his *Journey from Aleppo to Jeruſalem* (p. 5, 6.) deſcribing the paſſage out of the juriſdiction of the *Baſſa* of *Aleppo* into that of *Tripoli*, accidently gives us an account of a *Swallet-hole*. "Having ſpent about two hours we deſcended into a *low valley*: at the *bottom* of which is a *fiſſure* into the earth, of a *great depth*; but withal ſo narrow that it is not diſcernible to the eye till you arrive juſt upon it: though to the ear a notice of it is given at a great diſtance, by reaſon of the noiſe of a ſtream running down into it from the hills. We could not gueſs it to be leſs than *thirty yards deep*: but it is ſo narrow that a ſmall arch, not four yards over, lands you on it's other ſide." The Author of *Obſervations on divers paſſages of Scriptures* &c. thinks that *Solomon* alludes to this dangerous place, when he ſays, *The mouth of a ſtrange woman is a deep pit: he that is abhorred of the Lord ſhall fall therein.* Prov. xxii. 14.

PROBABLY of the ſwallet-kind was the *Cave* of *Adullam* mentioned 1 *Sam.* xxii. 1. to which *David* with *four hundred men* fled, in order to hide

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and defend themſelves from the power of *Saul:* and of the ſame ſort might That have been, mentioned 1 *Kings* xviii. 4. in which *Obadiah* hid an *hundred prophets* of the Lord.

UNDER this head may be reckoned a remarkable *Cavern* in *America*, ſituate about ninety miles weſt of the city of *Philadelphia*, on the banks of *Swatawra Creek*; of which an account is given at large in the *Univerſal Muſeum* for *January* 1766.

THE famous Grotto, in one of the iſlands of the *Archipelago*, called *Anti-paros*, which is reputed to be *nine hundred yards* deep, and has ſeveral *collateral Cavities* and *profound Abyſſes* in it, is certainly a *great Swallet*, as is abundantly evident from the deſcription given at large of it by Monſ. *Tournefort* in his *Voyage into the Levant*, Vol. I. p. 146, &c.

SCHEUCHZER in his *Itinera Alpina*, Vol. I. p. 281, ſpeaking of a lake upon one of the mountains of the *Alps*, writes thus, "*Circa hunc lacum*, &c. You may ſee on every ſide around this lake certain *winding traces* or *furrows* worn in the hard rock, which perhaps were owing to the waters of the deluge."

KIRCHER in his *Mundus Subterraneus*, (lib. ii. cap. xx.) gives particular accounts of *ſeveral Caverns* (too long to be inſerted here) and ſhews from a variety of Authors, that ſuch like cavities are to be found in all parts of the world, both in *Europe*, *Aſia*, *Africa*, and *America*; and as no doubt is to be made that ſimilar effects were owing to ſimilar cauſes, ſo we may ſafely conclude, that

the caverns in other parts of the earth were formed by the ſame means and are of the ſame kind with thoſe in *England*; and as I have already ſhewn that thoſe in *England* were owing to or at leaſt have been torn and widened by the paſſage of ſtrong currents of water, ſo we muſt determine of the reſt; and of courſe that the water was as extenſive as its force, *i. e.* extended all over the earth, and therefore that there has been an *Univerſal Deluge*.

I SHALL now ſubjoin a corollary, or an obſervation or two, to what has been above diſcuſſed, by way of general proof of ſome of the particulars already advanced.

1. As the regular deſcent of combs, dales, and vallies, and the final union of all theſe in one large furrow, even under the ſea, ſhewed that the water that excavated theſe hollows deſcended into ſome great cavity in the inſide of the earth, even beyond the bed of the ocean, and there formed an *Abyſs*;[d] ſo the collateral conduits of the ſwallet-holes, leading down into one great unfathomable cavity in the bowels of the earth, prove that the water that formed them deſcended likewiſe even through the ſhell of the earth, and there conſtituted a part of the above-mentioned *ſubterranean Reſervoir*.

2. IT is not uncommon to find Swallets that have ſmall rivers running into them, and which have no known exit; and when miners are digging very deep in the earth, they ſometimes break ſideways into a ſwallet-hole, and when they do ſo,

[d] See Page 279, &c.

ſo, they advantageouſly turn all the water of the mine into it, and moreover throw in all the rubbiſh they dig out, and yet can diſcover no bottom. And if thoſe lakes mentioned p. 229, which receive one or more large rivers into them, are alſo ſwallets (as I have above ſhewn they in all probability are) then this alſo is a proof that there is a *ſubterranean reſervoir of water*. And leſt any one ſhould imagine from this particular, that therefore ſwallets *in general* might have been formed by *river-water*, let it be remembered that they are *commonly* found upon the *tops* of the *higheſt* mountains, eſpecially ſuch as have *extenſive flats*, where neither river nor rain-water could have any force to tear ſuch cavities, and therefore they could not owe their origin to ſuch a cauſe. In thoſe places indeed where theſe holes lie at the bottoms of mountains, ſuch rivers as take their riſe near the tops would naturally flow into them; and where the ſwallet-holes are *ſuperficial*, or even run for a conſiderable way under the earth but *not deep* into it, would flow out again; in the ſame manner as the rivers run down the bottoms of combs and dales, or any natural declivity or hollow; but as theſe latter were not formed by river-water, ſo neither were the former.

3. As ſwallet-holes are extended all over the earth, and the water that formed them deſcended downwards from every ſide towards the center and paſſed through the ſhell of the earth, it would naturally repoſit *at the center* all the matter that it tore out in excavating theſe hollows, which would there conſtitute a *nucleus* or *inner globe*.

4. After the ſtricteſt ſearch and examination I could make, either from books or obſervation, I could never learn that there had ever been any *natural* ſea-ſhell, coral, or coralline diſcovered in any of the caverns at land in the manner they are frequently found in the caves and cavities in the rocks on the ſea-ſhore, the ſides of which are uſually lined, and the ſmaller cracks and crevices filled with them; but no ſuch being to be diſcovered in the caverns and ſwallet-holes at land, we may ſafely conclude, that the parts of the earth where theſe in-land cavities are were never the bottom of the ſea, or for any conſiderable time covered with the ocean; and therefore that the hypotheſis (lately renewed and refitted by ſome *French* philoſophers, and favoured by ſeveral *Engliſh*) is falſe, which attributes the manifeſt appearances of this globe's having been covered by water to the primæval inundation of the ſea, by which it is ſuppoſed that, at the firſt ſettlement of things, the water would naturally cover the whole ſurface of the globe, and conſtitute a ſea over every part; but after a long time (by ſome means or other) it receded and permitted the ſea to retire into the lower and hollow parts of the earth; and to this original inundation or diſpoſition of things are to be attributed all the marks of an inundation on the ſurface and in the inſide of the earth; but had this been the caſe, theſe in-land caves would have been filled with the ſpoils of the ocean, and we ſhould ſee ſhells, corals, and corallines, in their *natural* ſtate, ſticking on to the ſides and filling the crevices of the rocks;

rocks; whereas all the ſhells and corals that ever I diſcovered in theſe caverns were in an *extraneous* ſtate, either filled with ſtone or immerſed in the ſolid body of the rock, which could never have been their natural ſtate; and therefore they could never have been placed in this manner according to the common laws of nature.

5 And from the ſame arguing and circumſtances of things we may have undeniable marks how far the ſea, in any place for any conſiderable time, has covered the land; for if in the holes and caves of the earth, in any ſuch ſuppoſed place, there be found ſhells and corals in their natural ſtate, eſpecially if they be of the kinds with thoſe uſually growing in the neareſt adjoining ſea, we may then juſtly ſuppoſe that the ſea has covered theſe parts; but if no ſuch ſhells or corals be diſcovered in theſe caverns, then we may depend upon it that the ſea has never reached theſe parts, or covered them in the manner it now covers and overflows it's uſual and well-known bed, the ſea-ſhore.

IV.

Another general and comprehenſive Proof of an Universal Deluge may be drawn from the numerous and various *ſpoils* of *ſea* and *land animals* and *vegetables* that are now found in every part of the earth.

" Here then [to make uſe of the words of a learned and ingenious Author [e]] we appeal once more

[e] *Revelation examined with Candour*, Vol. I. p. 192; and for the truth of the ſubſequent particulars, and many more equally ſurprizing,

more to Nature; and find that, in fact, there are, at this day, as evident, as demonſtrative, as inconteſtable proofs of the deluge, over the face of the whole Earth, at the diſtance of about *four thouſand years*, as if it had happened but laſt year. And whereas *Moſes* aſſures us, that the *waters prevailed fifteen cubits above the tops of the higheſt mountains*, let the mountains themſelves be appealed to for the truth of this aſſertion: examine the higheſt eminences of the earth, and they all, with one accord, produce the ſpoils of the ocean depoſited upon them on that occaſion; the ſhells and ſkeletons of ſea-fiſh, and ſea-monſters of all kinds. The *Alps*, the *Apennine*, the *Pyrenees*, *Libanus*, and *Atlas*, and *Ararat*, every mountain of every region under heaven, (where ſearch hath been made) from *Japan* to *Mexico*, all conſpire in one uniform, one univerſal proof, that they all had the ſea ſpread over their higheſt ſummits. Search the earth; you ſhall find the mouſe-deer, natives of *America*, buried in *Ireland*; elephants, natives of *Aſia* and *Africa*, buried in the midſt of *England*;[f] crocodiles, natives

ſurprizing, the Reader may conſult Dr. WOODWARD's, Dr. SCHEUCHZER's or DARGENVILLE's Writings; or indeed any other eminent Author on the ſubject.

[f] One circumſtance of this kind I ſhall mention of my own knowledge. A few years ſince I received, as a preſent, from a Gentleman in *Somerſetſhire*, four teeth *(dentes molares)* two thigh-bones, and part of the head of an *Elephant*, that were dug out of *Hutton-Hill* (which is a branch or a lateral continuation of the high ridge of *Mendip* Hills) in *Somerſetſhire*. Upon the reception of this preſent, and information that there were ſtill ſome other bones left behind, I went down to the place, and, in company with three or four other perſons, entered the pit from whence they were

tives of the *Nile*, in the heart of *Germany*; ſhell-fiſh, never known but in the *American* ſeas, together

were dug; and found two other *dentes molares*, or grinders, one of them lying in the jaw, three rib-bones, two thigh-bones, part of a tuſk, with a multitude of leſſer bones belonging, in all probability, to the ſame animal. Beſides theſe we picked up part of a large Deer's horn, very flat, and the ſlough of a horn (or the ſpungy porous ſubſtance that occupies the inſide of the horns of oxen, &c.) of an extraordinary ſize, together with a great variety of teeth and ſmall bones, belonging to different ſpecies of land-animals. One of the men, that had been at work in theſe pits, brought me a collection of ſmall bones that he found in a pit adjoining, lying by themſelves, and no extraneous body near them. Upon putting theſe bones together at my leiſure, I found they compoſed almoſt the entire ſkeleton of an animal, about the ſize of a fox; but the teeth, jaw, and ſeveral of the bones did not anſwer to any *European* animal I was acquainted with. The ſame perſon aſſured me, that before I came down, he had found in digging in the ſame place the head of a ſtrange animal, that he believed was near three feet in length, a foot broad in the hinder part, and three or four inches at the extremity, from whence iſſued four tuſks, two from each jaw. The teeth were large, and all well preſerved in the jaw. From this deſcription it ſeems to have been the head of the *Hippopotamos*, or *Sea* or *River-Horſe*. [The neareſt river to us in which this animal is bred, is the *Nile*.] He had concealed this head in a wood adjoining, but ſo carefully, that neither he nor myſelf could ever after find it. All theſe bones lay in a dark yellowiſh ochreous kind of matter, from fifty to an hundred feet deep. The largeſt and greateſt number lay about ſeventy feet deep in an horizontal cavity (that had been dug for the ochre) eighteen yards long, and ſix feet ſquare. The bones and teeth were extremely well preſerved, all retaining their native whiteneſs, and as they projected from the ſides and top of this cavity, exhibited an appearance not much unlike the inſide of a charnel houſe. We ſtaid in this place two hours, digging out all the bodies we could find, till the roof in two or three places began to fall in, and we thought it too dangerous to continue any longer. Upon my ſecond intention of viſiting it, I was informed, the whole had fallen in. There were no marks nor the leaſt ſign of any pit having been opened on this hill beſides thoſe dug for the ochre; and the perſon who opened the firſt pit aſſured me, he believed the hill had never been dug into before. Which conſideration, together with the number of *ſtrange bones* and *teeth*, belonging

gether with entire ſkeletons of whales, in the moſt in-land regions of *England*; trees of vaſt dimenſions, with their roots and tops, and ſome alſo with leaves and fruit, at the bottoms of mines and marles; and that too in regions where no tree of that kind was ever known to grow; nay, where it is demonſtrably impoſſible they could grow."

THIS has been thought by ſeveral to be the chief and indeed the only argument that could be brought in proof of an Univerſal Flood, and hence it has been oppoſed by every objection that the infidel could think of. About a century or two ago it was urged, that theſe foſſil Animals and Vetetables were not really what they appear to be, but only *Mock-forms*, or repreſentations of ſuch things, cauſed by a *luſus naturæ*, or an accidental Sporting of Nature under-ground. But ſince this affair has been more accurately inquired into, and collections of ſea and land Productions been made from every part of the globe, and compared with the foſſils of the ſame kind, ſuch a nice reſemblance and exact agreement has been found between them,—" The foſſil ones being of the ſame ſize that the others are of, and of the ſame ſhape preciſely; of the ſame ſubſtance and texture; as conſiſting of the ſame peculiar Matter, and this conſtituted and diſpoſed in the ſame manner, as that of their reſpective fellow-kinds at Sea: the tendency of the fibres and *Striæ* the

longing to *different animals*, of countries *far diſtant* from *England*, and the *depth* in which they were found (without mentioning other circumſtances, that cannot be enlarged upon in ſuch a note as this) may ſerve as a ſufficient proof that they were left there *by the Deluge*.

the ſame: the compoſition of the *Lamellæ*, conſtituted by theſe fibres, alike in both: the ſame *Veſtigia* of Tendons (by means whereof the Animal is faſtened and joined to the ſhell) in each: the ſame *Papillæ:* the ſame *Sutures*, and every thing elſe, whether within or without the ſhell, in its cavity or upon its convexity, in the ſubſtance or upon the ſurface of it: anſwering all Chymical tryals in like manner as ſea-ſhells do; their parts when diſſolved have the ſame appearance to view, the ſame ſmell and taſte; they have the ſame *vires* and effects in medicine, when inwardly adminiſtered, to animal bodies; *Aqua-fortis*, *Oil of Vitriol*, and other like *Menſtrua*, have the very ſame effects upon both"[g]—Such an exact agreement as this, I ſay, being found between the foſſil and natural bodies of the animal and vegetable kind, it is now univerſally allowed that the foſſil are, what they appear to be, the *Remains* of *deſtroyed Animals* and *periſhed Vegetables*.

And at preſent a *prevailing opinion* is, that though theſe bodies are what they appear to be, yet thoſe that ſeem to have belonged to the ſea were never of marine production, nor the vegetables the growth of the earth, but both ſorts were produced and formed in the places where they are now found, the ſemina of theſe things having been placed in and diſperſed throughout the whole globe of the earth at the time of it's Creation, when all things were confuſedly mixt together: and ſince that time theſe ſemina have occcaſionally

[g] Woodward's *Nat. Hiſt.* p. 23.

occaſionally ſhot out, grown, and increaſed by ſome plaſtic virtue or power.

But till this plaſtic virtue or power be farther ſhewn, and proved to exiſt, it will be looked on by all ſenſible perſons to be no other than the *luſus naturæ*, or an *occult Quality* of the Ancients.

And with regard to the Semina of theſe bodies being placed in the earth at the time of the Creation, when the whole earth was in a diſſolved chaotic ſtate, it muſt be remembered (if we follow the *Moſaic* account, which I have already ſhewn is the only true, p. 126, &c.) that the *ſemina* of theſe things were *not made* till *after* the *earth* was *conſolidated* and *dry land had appeared*, (Gen. i. 12, 20, &c.) ſo that they could never have ſunk through the earth at that time: and if it be ſuppoſed that ſome of them ſunk through after, it muſt have been through the *cracks* and *crevices*, not the ſolid body, of the earth; but unfortunately for this opinion there are ſcarce ever any of theſe bodies, even in a foſſil ſtate (never any in a natural) to be found in the cracks and crevices, but commonly *all fixed in the ſolid ſtrata*; and as that part of the ſtrata, which immediately ſurrounds theſe animal and vegetable bodies, has the expreſs image of the outſides of theſe bodies delineated upon it to the niceſt exactneſs, it is certain that the Rock, Stone, Clay, &c. that contains theſe bodies, was formed and hardened after them; as certain as that the impreſſion of a Seal upon Sealing-wax was poſterior to the ſeal; and both formed after a different manner, at different

times,

times, and in different places. Beſides, as *Fabius Columna* argues, " *Natura nihil facit fruſtra.* Nature makes nothing in vain; but theſe teeth, bones, ſhells, &c. were they thus formed in the earth, would be in vain; for they could not have been of any uſe as teeth, neither could the bones have been of uſe in ſupporting of any animal. Nature never made teeth without a jaw, nor ſhells without an animal inhabitant, nor ſingle bones, much leſs pieces of bones, teeth, &c. no not in their own proper element, much leſs in a ſtrange one." Therefore the places where theſe bodies are now found could never have been their original.

And in order to ſhew that the *foſſil* ſhells, bones, teeth, &c. that ſo exactly reſemble the *marine* ones of the ſame ſpecies, were really the product of the ſea, and not formed in the places where they are now found, I ſhall make uſe of a few arguments as they are judiciouſly drawn up by Dr. *Woodward* in his *Nat. Hiſt. of the Earth illuſtrated*, p. 151. " Firſt, the *(foſſil)* ſhells, which are digged up in places, and found lodged in matter, fit to preſerve them, and which therefore are firm, ſound, and have leſs felt the injuries of time, yield ſtill a true marine ſalt, ſuch as recent ſhells taken out of the ſea, or caſt on the ſhores, are wont to yield. Secondly, There are alſo found in the earth the teeth of fiſhes ground down and worn away, in the very ſame manner as the teeth of thoſe kinds of fiſhes, taken at ſea, uſually are, by chewing their food. Thirdly, The ſhell-fiſh called the *Purpura*, has

a tongue

a tongue of a conſiderable length, terminating in a hard bony ſharp point, with which, as with an augre, he bores holes through the ſhells of other ſhell-fiſh, and feeds on the ſubſtance of them drawn forth through thoſe holes. Now there are commonly found in the earth, among others, ſhells bored thorow in the manner above deſcribed, whence it is certain that thoſe ſhells had once living fiſhes in them, and that thoſe fiſhes formerly lived in ſome place, where alſo there were *Purpuræ* to feed on them: and that place could be no other than the ſea. Fourthly, It is common to dig up the ſhells of Oyſters, *Conchæ*, *Pectines*, and other Bivalves, which retain plain marks of tendons, and other ſigns which undoubtedly ſhew that they had once living creatures in them. Fifthly and laſtly, The *Echinitæ*, *Conchitæ*, *Cochlitæ*, and other bodies of that kind, conſiſting of ſtone, flint, ſpar, and other mineral matters, which every way match the ſize and exhibit the perfect reſemblance of the interior part of thoſe ſhells, from which they have derived their names, could never have been ſo formed, moulded, and ſhaped, had not thoſe ſhells been quite empty. But there are other bodies alſo, of which I have ſamples by me, formed likewiſe of ſtone, flint, and ſpar, which repreſent only pieces, or ſome particular parts of the *Echinitæ*, *Conchitæ*, and *Cochlitæ*. Theſe any one, at firſt ſight, may plainly diſcern were formed in the ſhells, while they had yet their fiſhes actually in them; and therefore could receive only ſo much of the ſtony, flinty, or ſparry matter

as

as would fill up the parts which were empty or vacant, and not poſſeſſed or taken up by the fiſh. Thence it is, that thoſe ſtony, flinty and ſparry bodies bear only the reſemblance of that vacancy, as having been moulded in it. Now theſe bodies plainly ſhew thoſe ſhells to have had fiſhes formerly in them: and at the ſame time point forth to us the true origin of them, viz. that they were not produced in the places where they are now found, but were at ſome time brought all from the ſea."

OTHERS indeed allow that the foſſil animal and vegetable bodies are really what they appear to be, and that the marine ones were produced at Sea; but then they ſuppoſe that they were brought to land by *partial deluges*, or *occaſional inundations of the ſea*. But certain it is, there are no records in hiſtory of any ſuch inundations that can by any means be applicable, either with reſpect to their *Antiquity* or *Extent*, to the phænomena of this kind obſervable throughout the whole body of the Earth. The *Pyramids* of *Egypt* are reckoned to be ſome of the moſt ancient ſtructures in the known World, and ſituated alſo in a Country that is frequently overflooded by the Sea, and yet the Stones of which theſe Pyramids conſiſt abound with *foſſil marine ſhells* and *corals*; (as I have ſeen in ſeveral ſamples of theſe ſtones, and have ſome ſpecimens by me, given me by Dr. *Shaw*) and theſe ſhells and corals are of the ſame kind with thoſe that are now found in the regular ſtrata of the earth in the neighbourhood of theſe buildings.[b]

So

[b] See SHAW's *Travels*, p. 416.

So that it is evident that theſe marine bodies were brought to land before the time of erecting theſe Pyramids.

AGAIN; *Steno* (who was an *Italian*, and wrote about a Century ago) in his *Prodromus* to a Diſſertation *De Solido intra Solidum naturaliter contento*, i. e. *Concerning Solids naturally contained within Solids* (p. 87.) ſays, That in the *foundation-ſtones* and *walls* of the City of *Volaterra* (the ancient Seat of the *Etrurians*) there are various ſorts of *ſhells*; and the ſhells are of the ſame ſpecies with thoſe that are found in the ſtone and natural beds of the Hill on which the City formerly ſtood. Now it is certain that *Volaterra* was a place of great note and power, long before the foundation of *Rome*. It is now ſomewhat more than *two thouſand five hundred years* ſince *Rome* was firſt founded. And certainly ſeveral centuries muſt have paſſed from the time that the *Etrurians* firſt ſettled there, till their City had gained the character and ſize it had when *Rome* was firſt began to be built. Now if we allow but *five* or *ſix hundred years* for the completion of this, it will then follow, that theſe ſhells have remained there for at leaſt *three thouſand years*. And when we conſider that this will advance the proof of their exiſtence to within *one thouſand years* of the very time when the *Deluge of Noah* happened, ſurely none will be at a ſtand to attribute the time of their tranſportation to this Cauſe, which in every reſpect was anſwerable thereunto, and prior to all accounts of partial Floods.

BUT

BUT when we take in the additional circumſtance of the *extenſiveneſs of the Effects* of *that Deluge* in which theſe things happened, the matter will ſoon appear inconteſtably clear. Let any one read the argument in proof of an *Univerſal Deluge* as ſtated and deſcribed p. 359, &c. and he can never, with the leaſt ſhew of reaſon, attribute the *Effects* there related to *partial Floods*. Beſides; I have already laid down ſuch marks as will demonſtrably ſhew, how far the Sea in any place has occaſionally covered the land, and that the effects of an Univerſal Flood are viſible where partial inundations never reached (p. 330); and alſo have ſhewn that the marine bodies that are diſcovered at land are found in *ſuch places*, viz. *in the ſolid ſubſtance* of the ſtrata, where partial floods or any mere inundation of the Sea, how extenſive ſoever, could never have placed them, and that theſe bodies are ſcarce ever found in *thoſe parts*, viz. in the *cracks* and *fiſſures* of the earth, where ſuch floods would moſt naturally have thrown them (p. 364); which is an *unanſwerable* argument againſt this hypotheſis: and other particulars, to ſhew the weakneſs of this Suppoſition, will occaſionally occur in the proceſs of this treatiſe.

BUT before I finiſh this head, it may be proper to take notice of *Monſ. Le Cat*'s argument againſt the opinion of the foſſil animal and vegetable bodies being placed in the earth at the time of *that Deluge* which is recorded in Scripture: "The waters of the Deluge, ſaith he, according to the aſſertion of Scripture itſelf, exceeded the higheſt mountains by fifteen cubits; whence it muſt

follow, that theſe mountains were *before* the Deluge. Now in the bowels of theſe mountains are found animals incloſed in the ſtones and quarries of which they conſiſt. Therefore thoſe animals, incloſed in the baſes of theſe mountains, muſt have exiſted, together with thoſe mountains, before the Deluge. The Deluge then is a Revolution which does not account for theſe phænomena." But *Monſ. Le Cat* ſeems not to have conſidered, or not to have known, that the mountains that were before the flood and thoſe that were after were not one and the ſame, but formed at *two different times*, and with reſpect to the point in queſtion vaſtly different. The mountains that were *before* the flood were formed by the retreat of thoſe waters that *firſt* covered the ſurface of the earth, and permitted *dry land to appear*, on the *third day* after the Creation (p. 64), which was *before* any animal or vegetable body was made; and therefore no ſuch could poſſibly have been found in thoſe mountains. The mountains that were formed *after*, or at the end of the Flood, had their origin at a time when the earth was replete with animal and vegetable bodies; and as all the ſolid ſtructure of the earth had juſt before been totally diſſolved (and ſo all the antediluvian mountains wholly deſtroyed, p. 85.) but theſe animal and vegetable bodies preſerved entire, it could not but be that in the ſettlement of this diſſolved earth theſe bodies would be found involved therein, and buried at the loweſt depths; which could not have been the caſe with regard to the mountains before the flood, for the reaſons

above

above given: and therefore *Monſ. Le Cat*'s argument, which he is pleaſed to ſay is founded upon a "Reaſon which admits of no reply," is, in ſhort, founded upon a *falſe matter of fact*, and ſo deſtroys itſelf.

As likewiſe is another boaſted argument of the favourers of *M. Le Cat*'s Syſtem: which in ſhort is this, That ſince it is common to find among other foſſil ſhells, corals, &c. many that have been broken and worn ſince they were firſt placed in the earth, and in particular the caſts of ſhells now worn round or of a form different from what they originally had, it is very certain, ſay they, that there muſt have been *two Deluges*, at leaſt, for the execution of theſe phænomena. One, in which theſe ſhells and the ſtony matter that now fills them, were laid in their proper beds; and another, in which they have been removed, worn, and injured by being agitated a ſecond time in the turbulent waters of a flood. But ſurely to have recourſe to more cauſes than one, to explain any phænomenon in nature that may be eaſily explicable by the effects of one, ſhews neither the philoſopher nor the divine. It is certainly the greateſt proof of wiſdom (if we may judge from the works of the All-wiſe) to act by the moſt ſimple means, or to produce the greateſt variety of effects from one and the ſame cauſe. And the antient philoſophers were ſo ſenſible of this, that it was a ſtanding maxim with them, *Entia non ſunt multiplicanda abſque neceſſitate.* And it is ſo with theſe philoſophers in caſes where *Scripture* is not concerned: but to attack and invalidate

That, it is lawful to deviate from any eſtabliſhed rule, and make any the wildeſt and moſt unreaſonable hypotheſis imaginable. For what they attribute to *two Deluges* may far more reaſonably be aſcribed to *one*. I have already ſhewn at large, that the matter, that once filled the preſent combs, dales, and vallies, was of the ſame kind of ſtrata or ſtone with that in the adjoining rock or mountain, and that this matter was broken and torn from it's original bed, and laid here and there, or diſperſed over the ſurface of the whole earth, in large fragments of rocks or ſmall looſe ſtones, ſome round, other angular, by the deſcending waters in the univerſal Deluge in the time of *Noah*: and if theſe effects are to be attributed to that cauſe, then certainly the ſhells, and corals, and ſtony caſts of ſhells that are now found worn and rounded, as they once were included in, and conſtituted part of, theſe broken ſtrata, would ſuffer the ſame fate with the ſtrata themſelves, and be found worn and broken juſt as the fragments of ſtone, &c. themſelves now are. And whoever would have a right notion of the effects of the Deluge, ſhould be very careful to make proper diſtinctions between what was done by the waters at their *firſt eruption* from the abyſs, and what was effected by them in the end of the flood, at their *retreat* thither.

THUS I have ſhewn, by ſeveral general and extenſive arguments, the certainty of an *Univerſal Flood*, or that this earth has been covered to an immenſe height by an inundation of water; and more-

moreover have proved, that this water was brought from the abyſs beneath, and have ſhewn that in ſeveral other reſpects the effects of the flood, ſo obſervable on and in every part of the earth, are exactly conſonant to, and cannot with propriety be attributed to any ſuppoſed event of this kind other than, that Deluge which happened in the time of *Noah*, and is deſcribed by *Moſes* in his writings. And

In the proceſs of theſe arguments the reader cannot but have obſerved, that I have been very careful and induſtrious in collecting a variety of teſtimonies (beſides my own) from different Authors who lived at different times and in different places, in order to confirm and eſtabliſh the chief particulars upon which each argument depends; ſo that it appears that there is ſcarce a region under heaven but what bears teſtimony to the Universality *of the flood*: but leſt the reader ſhould ſuſpect theſe evidences, or rather would be ſatisfied in this caſe by nothing leſs than *ocular demonſtration*, I would deſire him to aſcend the neareſt high mountain to the place where he lives, and carefully examine the upper parts of it, and in all probability he will ſoon find ſome marine extraneous foſſil, either a ſhell, tooth, bone, coral, coralline, or elſe ſome in-land pebbles, trains of ſtone, &c. or at leaſt perceive ſome one or other of the marks already given, whereby he will ſoon be ſatisfied that this mountain has been covered to a conſiderable height by an inundation of water: and if this mountain was thus covered, certainly the combs, dales, and vallies beneath (which

were formed by currents of water from this mountain) were equally inundated: or rather, ſince the parts of water have no tie or connection with each other, but naturally fall away or are carried to the loweſt places firſt, it could not but be that every comb, dale, and valley, nay hill and mountain, over the whole ſurface of the earth, that was of equal height with this, muſt have been equally covered. So that, in ſhort, any perſon at this day, by giving himſelf only the trouble of viſiting the neareſt high mountain, may have full proof that that mountain was covered, nay, formed by water; and if any one mountain upon the earth was thus covered and formed, he will readily conclude that they all have been ſo; and hereby have, from any ſingle mountain, undeniable teſtimony that *all the high hills and mountains under the whole heaven have been covered by an inundation of water.*

THIRDLY.

I AM now come to the *third* Diviſion of this Section, wherein I am to ſhew, that, during the above-mentioned Flood, the earth was not only covered by water, but *totally diſſolved, all the mineral and metallic matter being reduced to it's original corpuſcles, and aſſumed up into the water; ſo that the whole terraqueous globe once conſtituted one fluid maſs or colluvies.*

THE effects of this *Diſſolution* are viſible on, in, and throughout the whole body of the earth. For,

I. THE

I. The very outward form of the earth indicates as much. I have already ſhewn that all the cavities upon the earth's ſurface, ſuch as combs, dales, vallies, &c. were once filled up with beds of matter of the ſame kind, and placed in the ſame manner, as their correſponding ſtrata in the ſides of the adjacent hills or eminences; ſo that the earth was once regularly round without any of the inequalities of hills and dales. But this form could never have been the reſult of matter ſettling in large ſeparate maſſes or detached rocks: had the parts of the earth ſubſided in ſuch enormous fragments as theſe, the ſurface of the earth would have been almoſt as irregular as it is at preſent. But as the earth, when the parts of it firſt ſettled, was perfectly ſpherical, and all the ſtrata lay upon each other with the niceſt exactneſs in parallel circular lines; ſo it muſt follow, in order that ſuch a regular diſpoſition of things might take effect, that the whole was diſſolved, and ſubſided in the minuteſt parts or primogenial atoms.

II. The ſpherical ſhape of the earth alſo may be juſtly eſteemed as the natural reſult of the equal preſſure of the air upon it's once fluid diſſolved parts. It is certain that whatever is in a fluid ſtate, and is ſurrounded and ſupported by the air, is of a globular form; and as the earth is not only buoyed up, but at preſent preſſed on all ſides by the air, and was at firſt formed by its circumambient force, and as this force is not ſufficient to reduce ſolids (if of a different figure) into a regular ſpherical ſhape, unleſs the parts thereof are ſo inti-

mately mixed with a fluid as to be equally ſuſceptible of motion, ſo the earth, unleſs it had been diſſolved, and the parts of it blended with a fluid, could never have been modelled to a globular form.

III. The ſolidity or coheſion of the ſolid parts of the earth is another proof that the whole has been diſſolved and immerſed in a fluid. If you take any of the ſolid ſubſtances of which the earth conſiſts, though reduced to the minuteſt ſize poſſible and preſſed ever ſo cloſe together, yet if the maſs is free from all moiſt or fluid particles, the whole will ſtill remain in a manner diſunited and the parts thereof eaſily ſeparable from each other, being no other than a congeries of fine duſt or dry ſand preſſed together; and in order to bring the parts into ſuch a cloſe contact and coheſion with each other as to form a compact ſolid, there is a neceſſity of adding, or rather of intimately mixing with theſe ſubſtances ſome fluid body; in which and by which (on account of the lubricity of it's parts) the particles of the ſolids might be ſo moved and ſhifted every way, till at laſt ſimilar ſurfaces might meet, preſs out the fluid between them, and come into cloſer contact with each other than they were before; and this compreſſure and union ſtill continuing and increaſing by the farther expulſion of the moiſt particles, the maſs would at laſt be brought into a much narrower compaſs than it at firſt occupied, *i. e.* the parts would be brought into a cloſer contact with each other, and ſo the (before) looſe, ſeparate,

ſeparate, detached ſolids be united into one firm compact body. And if this be the general proceſs of conſolidation in the various ſubſtances of the earth that we can make any trials or experiments upon, we may reaſonably conclude the ſame of the whole; and alſo that the firmer, finer, and cloſer any body is at preſent, the greater has been the diſſolution and diviſion of it's parts.

IV. A FOURTH argument that the earth has been in a *looſe fluid* ſtate may be drawn from the conſideration of the *Veins* in ſome ſorts of ſtone, particularly in the hardeſt and moſt beautiful marbles. It is common to obſerve in ſuch, a great variety of matter in the greateſt variety of forms and directions; in ſome part matter that was lighter (to ſpeak in the common acceptation of words) than the neighbouring, preſſed down below the place due to its ſpecific gravity, and afterwards elevated to a conſiderable height, till at laſt meeting with matter that was heavier and making it's way downwards, the whole ſhall be curved by the aſcent of the one and the deſcent of the other into a vaſt variety of arches, conſiſting of the fineſt and moſt delicate lines: in other parts you may ſee ſtreaks or ſeams of different ſubſtances proceeding on, as it were, horizontally, in nearly ſtreight lines, till they have been met and oppoſed by other matter in a contrary direction; and at the point of conflux both ſpecies of matter turned back and deflected in all the variety of wave-like diſpoſitions that can well be imagined to have happened to two ſtreams of water, meeting each

each other in oppoſite currents: and in ſhort you may ſee all the diverſities of forms and figures in the ſolid that any kind of agitation in a fluid could poſſibly diſplay: and therefore we cannot but conclude, that the Solid was once in as great a ſtate of fluidity as if it had been a fluid itſelf. And though indeed theſe greatly variegated beds of ſtone are but few in compariſon of the ſtrata that compoſe the whole body of the earth, yet there are very few ſtrata but what have ſome ſuch wave-like ſtreaks or ſeams; and as theſe beds of ſtone are ſometimes found at conſiderable depths in the earth, and conſiſt of layers of equal thickneſs throughout, it had been impoſſible that they ſhould have been in a ſtate of fluidity, unleſs all the ſuperincumbent ſtrata had been equally fluid, or not formed: nay, when we conſider that theſe veined beds of ſtone generally conſtitute the hardeſt ſpecies of marble, we may reaſonably conclude, that if they were diſſolved, all the other ſtrata of the earth were equally in a ſtate of diſſolution.

V. It is common to obſerve in places where different ſtrata meet, that there has been ſuch an intimate mixture of both as could not poſſibly have happened without a free and eaſy interchange between each, and conſequently not without a diſſolution. Thus, for inſtance, in a country that abounds with chalk, where the chalk ends and a different ſoil and different ſtrata begin, (ſuppoſe that of free-ſtone) there is commonly to be ſeen upon the edge of theſe two countries a kind of ſubſtance between chalk and free-ſtone, conſiſting chiefly

chiefly of chalk upon the chalk-ſide of the country, and principally of free-ſtone upon that of the free-ſtone country; ſo that on the one ſide there is a coarſe ſort of chalk, on the other a fine ſoft ſpecies of free-ſtone: the former ſort gradually coarſer and coarſer the nearer it approaches the free-ſtone, the latter finer and finer the nearer it is ſituated to the chalk. And this I have obſerved for ſeveral hundred yards upon the ſurface of the earth, and for a conſiderable depth within it. A ſimilar kind of conjunction or intercourſe I have ſeen alſo between the ſtrata of ſand-ſtone and lime-ſtone, between flag-ſtone and iron-ſtone, and indeed every kind of ſtrata, where they happen to meet in conſiderable quantities, or large tracts of land abound with them. And generally, the greater the quantities that meet, the more extenſive the interchange appears to have been, and of courſe the diſſolution the greater.

VI. The formation and ſituation of *Nodules* plainly evince that the earth has been in a fluid diſſolved ſtate. What theſe are I have already in part ſhewn, and alſo how to diſtinguiſh them from ſea or in-land pebbles, p. 291. note *i*. But beſides the ſpecies of nodules principally there ſpoken of, viz. thoſe of a ſtony or mineral nature, there are others of the metallic or ſemi-metallic kind, ſuch in particular as the *Pyrites*. This body is found in great plenty, eſpecially in chalky countries, and commonly of a round form outwardly; and it's inward texture ſhews, that itſelf and all the matter around it has been in a fluid

fluid ſtate; for it conſiſts of a multitude of long and extremely fine ſpiculæ, cloſely united together, and all driven to a center; and the ſubſtance of which it is formed is of a quite different nature and kind from the matter or ſtratum in which it is uſually found, and bears but a very ſmall proportion to the ſtratum. Now this body muſt either have been formed out of the ſtratum, and afterwards have ſettled in it, or elſe been originally formed where it is now found: and in either caſe there muſt have been a diſſolution or ſeparation of the parts of both. For wherever the body was formed (either in the ſtratum where it now lies, or in any other above it) as it conſiſts of matter of ſuch a peculiar kind, and is of ſuch a particular ſhape as plainly to ſhew that it's atoms, during it's formation, were collected together from above, from beneath, and from each ſide (otherwiſe it could never have been of a radiated globular form), ſo it muſt follow that there muſt have been a ſeparation of it's own parts, and alſo of the matter around it, in order to permit a free and eaſy paſſage for the acceſs of one and receſs of the other ſort of matter. Other nodules there are that were undeniably formed out of the ſtratum where they now lie, and afterwards ſettled in it; eſpecially thoſe of the *coated* kind, and in particular where the coats or cruſts of the nodules conſiſt of the ſame kind of ſubſtances, reſpectively, with thoſe that conſtitute the ſtrata immediately above the bed where they are now found. Now it is certain that theſe bodies could never have obtained tegumenta of the ſame ſpecies of matter, and

placed

placed in the ſame order from the center with the ſuperincumbent ſtrata, unleſs they had paſſed through them; for the beds wherein they are now found have no ſuch matter in them (except what immediately ſurrounds theſe bodies themſelves), and the ſtrata underneath are frequently of a very different kind from either; ſo that they muſt have paſſed through the ſuperior ſtrata, and have procured their coats in their paſſage; and if ſo, thoſe ſtrata muſt undeniably have been ſoft and fluid, otherwiſe they could never have paſſed through them and have collected coats from each, as alſo muſt the bed have been ſo where they are now found, otherwiſe they could never have ſubſided and ſettled in it: ſo that the whole was once in a ſtate of *Fluidity*.

VII. But the moſt ſtriking proof of this kind may be drawn from the *extraneous* foſſils, or thoſe bodies that are now found in the earth, and which do not properly belong to the places where they are now found, ſuch as corals, ſea-ſhells; the bones, teeth, &c. of ſea and land animals; plants, trees, &c. Now I have already ſhewn (p. 365.) that the former ſort of theſe bodies were produced at ſea, and the latter at land; that the broken parts of theſe bodies once conſtituted complete forms; that the bones, teeth, and ſhells once belonged to living animals, ſurviving in their proper elements; that the leaves and branches of the vegetables once grew upon their proper plants and trees: ſo that the marine productions were originally bred and formed at the bottom of the ſea;

the

the terrene upon the ſurface of the land: but at preſent theſe bodies are found lying promiſcuouſly throughout the whole ſolid body of the earth; ſome at the tops of the higheſt mountains, others at the bottoms of the deepeſt cavities that were ever dug; and lying too in ſuch a manner as to make but one common maſs with the ſtrata in which they are found; and this not only in the ſofter kinds of ſtrata, as thoſe of clay, chalk, &c. but in the inmoſt ſubſtances of the hardeſt and cloſeſt marbles; and generally the harder and more compact the matter is, the cloſer and more intimately united is the extraneous foſſil; which, if a tooth or a ſhell, has not only the exterior ſurface or outward lineaments moſt nicely delineated in the rock, but the inſide totally replete with the ſame ſubſtance, every, even the ſmalleſt, vacuity and ſlighteſt indenture being filled up with ſtony matter; and in ſome caſes where the ſhell has been cloſed, the cavity through which the matter paſſed or entered into the ſhell is inconceivably ſmall; in others the various convolutions and different concamerations are ſo many and yet ſo minute, and the paſſage leading through them ſo extremely ſmall, as not to exceed in ſize the orifice of a capillary tube in the human body, and yet each and every one of theſe totally filled up with the ſtony ſubſtance; ſo that the matter contained within the ſhell exactly reſembleth any liquable ſubſtance caſt fluid into a mould. If the extraneous foſſil be a leaf, then not only the upper and under ſides are moſt accurately impreſſed in the rock, but the very pores filled to the inmoſt receſſes,

receſſes, and the leaf as turgid and as much ſwelled by the penetration of the ſtony matter, as if it had been for a long time ſoaked in, and moſt intimately permeated by, the particles of water. Now for a ſubſtance—The texture of which is inconceivably delicate and complicated, and even it's largeſt pores inviſible to the naked eye, and which once grew upon the ſurface of the earth—to be thus immerſed in, and penetrated by, the ſolid rock, and to have ſunk through the ſolid body of the earth to the greateſt depths we ever dig, is an undeniable teſtimony that the Earth was once as fluid as water itſelf. And theſe *extraneous bodies* point out alſo the *time* when *this Diſſolution* happened, viz. at the *Deluge*, and not at the Creation, as ſome have imagined (ſee p. 364).

VIII. The eighth argument I ſhall mention in proof of the Diſſolution is drawn from the *internal Structure* of *the ſhell of the earth*. It is well known to thoſe that are in the leaſt converſant with philoſophical matters, that all the various ſubſtances of which the main body of the earth conſiſts, are diſpoſed (as the Chymiſts call it) *ſtrata ſuper ſtrata*, or layer upon layer; and it is alſo well known that ſuch a Diſpoſition of things could naturally be the reſult of nothing but the *ſettlement* of theſe bodies in a *diſſolved ſtate* through ſuch a Fluid as *Water*. If, for inſtance, you take a certain portion of theſe bodies, and pulverize them to the fineſt degree imaginable, and mix them as confuſedly together as poſſible, and let them

them fall through a dry Fluid, ſuch as the Air, they will ſettle juſt in the ſame confuſed ſtate as they were at firſt, and without the leaſt appearance of forming *ſtrata*: if, on the contrary, you permit them to ſubſide through the water, they will ſettle more or leſs in parallel ſtrata.[i] Indeed it requires *twenty* or *thirty* times the Quantity of water to earth to make this layer-like ſubſidence tolerably apparent, even in the mixture of but *three* or *four* bodies. But the greater quantity of water you uſe, and the finer you pulverize the ſubſtances, the more apparent and regular the ſtrata will be: yet after all the trials that can be made, the diſtinction of ſtrata will never be ſo exact as they are in the body of the earth. It is not uncommon to ſee in the earth vaſtly large beds of ſtone, coal, clay, &c. lying each upon the other, at one depth the ſtone above the coal, at another depth the coal above the ſtone, in one part the clay above each, in another under all, &c. and yet each of theſe ſtrata ſo diſtinct in themſelves, and ſo nicely ſorted, that the ſtone contains none of the coal, nor the coal any of the ſtone, nor does the clay partake of either (only each ſtratum a little tinged on the ſides next to the adjoining ſtrata). Now the quantity of *water* requiſite

[i] I may here mention an old experiment made by HIPPOCRATES, vide *Lib. de Nat. Pueri*, (or LOWTHORP's *Abridgment of Phil. Tranſact.* vol. 11. p. 522.) "If *earth*, *ſand*, and *filings of lead*, be put into a bladder, and *water* added to them, and motion given to the *whole mixture* by blowing in the bladder through a reed; firſt they are all mixt together with the water, but in a while, continuing in a gentle motion, they ſeparate themſelves and retire *each* to it's *like*, the *lead* to the *lead*, &c."

requiſite for effecting this muſt have been *immenſely great*, and the *whole body of the earth* muſt have been *diſſolved* to it's *very elements* or *primogenial atoms*, to produce ſuch a regular aſſortment of ſtrata.

HAVING thus proved that *the whole ſtructure of the earth has been unhinged, the conſtituent parts thereof ſeparated one from another, and aſſumed up into a large body of water*; I ſhall now draw ſome concluſions from what has been advanced.

1. SINCE the quantity of water requiſite for the aſſumption of the diſſolved parts of the earth, and the ſubſidence of them in regular ſtrata, muſt be vaſtly greater than what appears of this Fluid on the ſurface of the earth or in the Seas or Ocean, there muſt be an *immenſely large body of water in the inſide*. I have obſerved already indeed (p. 167, &c.) that the water on the ſurface of the terraqueous Globe occupies more than two thirds of the earth's ſuperficies: but then it muſt be remembered, that the land is ſtill continued, in a great meaſure, under this water: and from the appearance of iſlands in the midſt of large ſeas, at a great diſtance from the ſea-ſhore, and from the many known ridges of mountains that run under the ſea, and from the time that, according to ſcripture, the waters of the deluge were retreating from the ſurface of the earth, we muſt conclude that the apertures in the ſeas through which the water deſcended are, comparatively ſpeaking, but ſmall: ſo that the ſhell of the earth is in a manner continued quite under the ſeas

(except where the above apertures occur). And probably the land under any ſea equals in bulk that ſea itſelf. So that upon a thorough inſpection of the whole ſhell of the earth, the terreſtrial parts vaſtly exceed the waters. And though there appears water enough upon the ſurface of the globe abundantly ſufficient for *barely covering* the dry-land, yet there by no means appears a quantity ſufficient for *diſſolving or aſſuming up the diſſolved parts of the earth, and permitting them to ſubſide in the manner we now find them:* and ſince this quantity does not appear upon the ſurface or within our reach, it muſt be in the inſide, and there conſtitute an *abyſs of water.*

2. FROM the quantity of water neceſſary for the ſublevation of the diſſolved parts of the earth we ſee, that all ſolutions of a deluge, without having recourſe to an *Abyſs*, muſt fail, or not anſwer the effects viſible throughout the whole body of the earth. And hence I am ſurprized, that a modern ingenious Writer[k] (whoſe works I have made ſome quotations from in this Tract) ſhould attempt to ſolve it without the introduction of ſuch means. He imagines that the water of the Sea *only* would be ſufficient for the work. And in order to account for the elevation of this water over the tops of the higheſt mountains, he ſuppoſes that the Omnipotent hand of GOD, or *firſt Almighty Cauſe, lifted up the bottom* or *bed of the ſea*, and by that means poured it's water all over the earth; *and by letting it drop down again*, reſtored all things to their former ſituation: and ſo the

[k] Rev. Mr. BORLASE *in his Natural Hiſtory of Cornwall*, p. 78.

the deluge was over. This he is pleaſed to call *the eaſieſt and moſt eligible method* of tranſacting this event: but I ſuppoſe that all methods are equally eaſy to *Omnipotence*; and I could mention an hundred other methods by which GOD *might have* deluged the world, and yet neither of them the true, though all equally eaſy to the firſt Cauſe. The point to be decided is, *What* was the *method* GOD *did uſe?* If we can diſcover this, we may depend upon it that *That* was *the moſt eligible*. Now GOD himſelf tells us that, in order *to deſtroy the earth by a flood of water, he broke up the Fountains of the Abyſs, and opened the windows of heaven (or the paſſages of the air* through the ſhell of the earth) and ſo *unhinged* and *diſſolved* the whole globe. This I have ſhewn to be the Caſe from the ſtate of the earth, from the Center to the Circumference; and all nature bears ample teſtimony to the truth of the Word of GOD: and yet Mr. *Borlaſe* is pleaſed to ridicule this method and characterize it as attended with "the *egregious abſurdities of an Abyſs, apertures, diſruptions of the ſhell, and the like:*" I was ſorry to ſee ſuch words fall from ſuch an Author, and as he gives us reaſon to think that he will write ſomething farther upon the ſubject, I hope he will kindly take this friendly hint, and re-conſider the affair.

3. FROM the certainty that the whole globe was diſſolved during the deluge we may ſee the impropriety of his Lordſhip's opinion,—that the ſuperficial parts only were affected during that cataſtrophe, and that the *Rubble* and *Slutch* left by the deluge on the ſurface of the earth are the *only*

marks of it's devaſtation ;[1] but we have ſeen that the very form of the earth throughout, it's internal conſtitution, it's diſpoſition in ſtrata, and theſe ſtrata abounding with the exuviæ of land and ſea animals, &c. manifeſtly demonſtrate it's Diſſolution in every part.

THOUGH indeed there is one circumſtance even in the *Rubble* and *Slutch* that indicates the *Diſſolution* of *the whole earth*, and therefore may not improperly be mentioned in this place. After all the reſearches I could make, or the beſt teſtimonies I could procure, I could never learn that there was ever any *ante-diluvian artificial thing*, either utenſil or weapon of ſtone, iron, or braſs, &c. found in the Rubble, as naturally left there by the waters of the deluge. All things of this kind that I have ſeen were evidently found in places where the Rubble had been diſturbed, ſuch as in old caſtles, camps, &c. and therefore the things themſelves might have been poſterior to the Deluge. And though the *Rubble* itſelf lies in an irregular manner (with reſpect to the regularity of *Strata*) yet it is not ſo irregular, but that had it been diſturbed or broken through by digging, &c. the rupture would have been viſible: for as it conſiſts of ſtreaks and ſeams extended lengthways or inclined in wave-like directions, any perpendicular irruption muſt have been diſcernible. So that if the Rubble, left by the deluge, naturally contains no metallic or mineral ſubſtance worked by the art of man or engraven by his device, we may then juſtly conclude that *all*

[1] See of this Tract, p. 18. &c.

all ſuch inſtruments, and of courſe all matter of the ſame kind with them, *i. e.* all the metallic and mineral ſubſtances in the whole body of the earth, were *diſſolved during the deluge*.

4. It may ſeem ſtrange to ſome, how it was poſſible that *all the diſſolved parts of the earth* ſhould float in or be ſupported by ſuch a thin ſubſtance as *Water*. But to ſolve this difficulty, let it be remembered, that they were *diſſolved*, and alſo to their *fineſt parts* or *original atoms*. Salt and Sugar, when in maſſes, will both ſink in water, but when the parts thereof are diſunited and ſeparated one from another, they are eaſily ſuſtained thereby: and the quantity of Salt that is ſwimming in the waters of the Ocean is inconceivably great, and if collected in one maſs would be immenſely weighty. Then too, there is no water whatever, even the moſt limpid, but what contains a great variety of earthy particles, as chymical experiments undeniably ſhew: nay, that there is a ſpecies of water or of a fluid (*Aqua regia*) that will diſſolve and ſupport the diſſolved parts of the heavieſt of terreſtrial bodies, *Gold*; and though the particles of the gold ſhall be ſwimming in or diſperſed through every part of this fluid, yet the whole ſhall be as clear as chryſtal.[m] Or, what is more to the purpoſe,

[m] It appears from *Exod.* xxxii. 20. and *Deut.* ix. 21, that Moses was ſo well ſkilled in Chymiſtry or Natural Philoſophy, that he knew the art of diſſolving and reducing gold to the fineſt powder, and making it bouyable on, and potable in, common water. For *he took the golden calf, which the children of* Iſrael *had made, and burnt it with fire, and ſtampt it, and ground it to powder,*

a Thunder-cloud, big with a deluge of rain, and containing a vaſt variety of terreſtrial ſubſtances, is yet ſupported, at a conſiderable diſtance from the earth, by ſuch a thin fluid as the air: now according to Scripture, at the time of the deluge there was a large body of expanding air in the inſide of the earth, acting or preſſing from beneath upwards, *i. e.* from the center to the circumference, which therefore would counter-act and in ſome degree abate the force of the perpendicular preſſure of the air or expanſe upon the ſurface of the earth, and by this means leſſen the power of, what is called, the *Gravity of bodies*, and ſo make them *lighter*; as is the caſe in rainy or miſty weather, when bodies do not weigh ſo heavy as at other times, and when, on account of theſe aſcending ſteams impeding the preſſure of the atmoſphere, the mercury alſo in the barometer ſubſides and ſinks. Such being the ſtate of the earth during the time of the deluge, it was really no more wonderful, that the water of the terraqueous globe (which in all probability exceeds in bulk ſeveral thouſand times the quantity of earth) ſhould ſuſtain all the diſſolved

powder, and ſtrawed it upon the water (of the brook that deſcended out of the mount) and made the children of Iſrael *drink of it.* "This he did, ſays a Commentator, to make them ſenſible how much they had debaſed themſelves in worſhipping ſo vile an idol, which, after paſſing through ſo many changes, was at length *thrown out into the draught.*" That gold may be reduced to powder, or a calx ſoluble in water, the Reader may ſee by conſulting Dickinson's *Phyſica Vetus & Vera*, p. 317. where alſo he will find ſuch an account of Moses's knowledge of nature, as ſufficiently to convince him that he was ſuperior to any modern Philoſopher whatever.

diſſolved ſtrata thereof, with the exuviæ of animals and vegetables then deſtroyed, than that a thunder-cloud ſhould contain and ſupport a vaſt variety of mineral and metallic effluvia, intermixt with hail-ſtones of various ſizes; for in both caſes a body of expanding air was the baſis and prop: and *Air*, as I have already ſhewn (p. 60.), will keep water *above* as well as *under* it.

That the ſtate of the earth and air, during the time of the deluge, was really different from what it is at preſent, is very manifeſt from ſeveral effects, then tranſacted, and now viſible, in the terraqueous globe. Certain it is, that neither the ſtrata of the earth, nor the heterogeneous bodies encloſed therein, do lie according to the *Laws of ſpecific Gravity*, or as bodies would ſettle at preſent. It is as common to find heavier ſtrata above lighter as lighter above heavier: and the ſame kind of ſtrata (after the interpoſition of both heavier and lighter ones) repeated; and in ſome places the whole in a retrograde order. So that this phænomenon ſeems plainly to point out the actions of *two Agents*, one that acted from above downwards, the other from beneath upwards: from whence it ſhould follow, that at the ſame time as the downright perpendicular preſſure of the Air ſeparated and precipitated any ſpecies of terreſtrial atoms through the waters of the deluge and formed them into a ſtratum, the ſame alſo did the Air from beneath, with reſpect to the ſame ſpecies on the oppoſite ſide. To effect which alſo there muſt have been a *total diſſolution* of the terreſtrial Globe, otherwiſe there could never have been

been ſuch a free and eaſy acceſs for the Air to and from the Center.

And what farther ſhews that there was a body of Air or ſome Agent at the center of the earth during the time of the deluge, which counteracted the force of Gravity, is the manner in which the diluvian Spars and Cryſtals are at preſent found; the ſhoots of ſuch being in ſome places perpendicularly upright, in others varied in all kinds of direction, but generally ſpeaking they are in an *horizontal poſition*, ſo that the angles and columns meet in and interſect each other from the ſides of the vein or fiſſure. But as the Spar that has been formed ſince the deluge, or, as the Miners call it, that is forming *at this day*, is always pointed *downwards*, (unleſs where the rock intervenes, and diverts it's natural courſe) hanging like icicles from the tops and arches of caverns, grotto's, &c. in form of *Stalactitæ*; it is evident that the preſſure of the Air downward is at preſent ſtronger than it was at the time of the Deluge: and as many of the diluvian Spars and Cryſtals are pointing perpendicularly upright, it ſhews that the force of the air from beneath upwards was then ſtronger than it is now: and of courſe that the *gravity of bodies* was leſs, and ſo more eaſily ſuſtainable in the waters of the flood than ſuch bodies would be now.

5. And this conſideration, that *the gravity of bodies* was *leſs* during the flood than before or ſince, will ſerve to remove another difficulty which hath been thought to attend the affair of the Deluge, viz. how it came to paſs, that ſhells, and corals,

corals, eſpecially ſuch as are called *pelagiæ*, or thoſe that live and grow only at the bottoms of the deepeſt ſeas, ſhould be now found upon the tops and in the bodies of the higheſt mountains, even ſuch as are at the greateſt diſtance from any ſea: whereas if the ocean itſelf were to be emptied out upon the earth, it would never carry *theſe heavy bodies* with it to ſo great a diſtance.

In anſwer to which objection I would firſt obſerve, as proved above, that the *gravities of bodies* were certainly *leſs* during the flood than ſince; which is moreover evident from the manner in which theſe bodies lye in the ſtrata; it being not uncommon to find one particular ſpecies of ſhells or corals, or even a row of ſingle ſhells, running parallel, or keeping the ſame depth with the ſtratum in which they are found throughout the extent of a whole country, or as far as the ſtratum itſelf continues; which is a plain proof that theſe ſhells ſettled together with the diſſolved parts of the ſtratum; and of conſequence were before ſo light as to be bouyed together with that in the ſame medium.

And with reſpect to the conveyance of theſe bodies from their original beds to the places where they are now found, it muſt be remembered, that not only the ocean, but the Abyſs itſelf was emptied out upon the ſurface of the earth: and as the Abyſs lies *beneath* the ocean, and came out through the apertures in the bottom of That, in order to cover the earth, it would neceſſarily bring along with it all ſuch bodies as lay looſe near thoſe apertures, and were bouyable in water, and

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carry them to the greateſt diſtance itſelf was carried.

And what would farther tend to the more eaſy conveyance of theſe bodies would be, that as there was a *central nucleus* or a globe of looſe terreſtrial matter at the center of the primitive earth (as is evident from the *Moſaic* deſcription of the formation of that earth, p. 64, &c.[n]) and as this globe conſiſted of nothing but lax incoherent matter, ſo, as the waters came out of the Abyſs, and the air occupied it's place, this globe would naturally be broken to pieces; and the parts thereof being diſſeminated through the water, and coming up along with it through the apertures of the ſeas, would drive away before it all looſe bodies, ſuch as

[n] Beſides, we are expreſsly told *Gen.* i. 10, That there were *Seas* in the ante-diluvian earth; there were alſo *Rivers* (*Gen.* ii. 10.) and *Mountains* (*Gen.* vii. 20.) and of conſequence *Vallies*, which are only the intervals between mountains, and without which mountains cannot be. The truth of which repreſentation is alſo ſufficiently evidenced by the *remains* of the *products* of the *ante-diluvian earth* now found buried in this. There are *foſſil ſhells*, the fiſh of which live and grow only in the *ſea*; there are other ſhells that could be found only in *river-water*; and there are *foſſil plants* now found that naturally grow only upon *mountains*; and others that germinate only in *vallies*. From whence it is very evident, that the *external form* of the ante-diluvian earth was much the ſame as the preſent, diverſified into ſeas, rivers, mountains, vallies, &c. and from what is ſaid in note p. 70, &c. the ſeas, rivers, &c. were in the ſame ſituation, with regard to themſelves, in the one earth as in the other. Now if the *external form* of the two earths were alike, there is no reaſon to imagine that the *internal* was not; at leaſt with reſpect to the point in queſtion, the exiſtence of the *central nucleus*, which I have already ſhewn was no more than the conſequence of the ſurface of the earth being torn and broken into hollows and channels for ſeas, rivers, vallies, &c. and the matter that before filled up theſe hollows being placed at the center: ſee pages 64, &c. and 280, &c.

as ſhells, corals, bones, &c. that lay near thoſe apertures, and alſo whatever land-productions that were of a light nature it might accidentally meet with in it's paſſage, and ſcatter them over the whole face of the earth.

So that it is no wonder that we find ſuch a ſtrange confuſion of things as ſea and land animals, corals, and corallines, of far diſtant places, lying in one and the ſame bed; and in particular that the *pelagiæ ſhells* ſhould be now found in the moſt inland parts; for as theſe ſhells lay at the bottom of the ſea, they would be ſubject and expoſed to the firſt and moſt violent irruption of the ſubterranean waters, and be carried by them over the face of the whole earth. And as it is well known (which has ſurprized many foſſiliſts) that we find a far greater number of ſhells of the *pelagiæ* kind than any other now buried in the earth, ſo it is hence evident that all recourſe to partial floods, or accidental inundations of particular ſeas (ſuppoſing ſuch to have been) can never ſolve theſe phænomena; and nothing but an irruption of the *ſubterranean waters*, and thorough waſhing and cleanſing of the *immenſe baſon* of the *ocean*, and the *bottoms* of *all the ſeas* by theſe waters, can account for theſe *extraordinary and extenſive effects*.

I MAY here juſt add that, notwithſtanding the ſea and all it's various productions were thrown out upon the land, yet the land and it's products were not thrown into the ſea: the earth was not diſſolved, till the waters had riſen to the higheſt (ſee p. 85.) and all was calm and quiet; ſo that the

the mineral and metallic parts of the globe, though reduced to their primogenial atoms, and vegetables and their ſeeds though floating in the waters, did not move far ſideways, but principally aſcended upwards and ſettled down again, in or near the ſame places from which they were before aſſumed. So that the waters, in their retreat into the Abyſs, would have much the ſame kind of earth to act upon at the end of the Deluge as they had at the beginning of the creation, and as they acted in both caſes in the ſame manner and under the ſame direction, the two earths would be alike.

6. But it has been farther aſked, *How came it to paſs, that the hardeſt rocks and the ſolid ſtrata of the earth ſhould be diſſolved, and yet ſuch tender ſubſtances, as ſhells, bones, teeth, and even plants, ſhould preſerve their texture and remain uninjured during the Deluge?*

In anſwer to which I would firſt obſerve, that the matter of fact is indiſputable, the former were diſſolved, and the latter were not; as the whole body of the earth proves to a demonſtration. The impreſſion of the moſt curiouſly engraved ſeal in wax cannot evidence the once liquid ſtate of the wax more than the exact delineation of the fibres of the moſt tender plant in ſtone proves the diſſolution of the ſtone: it is impoſſible that ſtone, unleſs it were ſoft and fluid, could receive the impreſſion of a plant, and impoſſible that the plant, unleſs it preſerved it's form and texture entire, could give ſuch an impreſſion. And as theſe impreſſions are found in the hardeſt rocks and firmeſt

ſtrata

ſtrata throughout the whole body of the earth, ſo the matter of fact is undeniable, and on this alone my arguments are founded. And therefore their force would not be invalidated if no other ſolution to this difficulty could be given. But I ſhall endeavour to proceed farther in the diſquiſition of this ſubject.

When indeed we view the immenſe ſtrata of the earth, or conſider the ſize and hardneſs of a ſingle rock, it appears ſcarce credible that that rock ſhould have been diſſolved and a tender plant preſerved entire in the inſide of it. And yet of this we have many ſimilar inſtances in the world. Certain it is that immenſe maſſes of ice frequently contain within them a vaſt variety of bodies, ſuch as ſhells, corals, bones, vegetables, &c. and the impreſſion of theſe bodies are as exquiſitely delineated in the ice, as the forms of the ſame bodies are frequently found to be in the hardeſt ſtone. Both ſubſtances therefore, that include theſe bodies, were once in an *equal ſtate of fluidity*, and yet the *bodies included* in neither caſe *deſtroyed* nor *injured*. Now let us ſuppoſe the ice to be expoſed to the influence of the Sun's rays; in which caſe the action of the cold air, which had hardened and congealed the water, would be taken off, and the frozen maſs, by the penetration of the particles of light, be ſoon reduced to it's original element; and yet the bodies included would remain whole and entire.

To enlarge the reader's idea, let him caſt his eye over a map of the earth and view the frigid Zones, or thoſe immenſe tracts in the ocean which

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are frozen at times or throughout the whole year; and let him ſuppoſe the action of *light* to *prevail* there, how ſoon would the whole be reduced to *atoms* or *fluidity?* and yet the fineſt ſhell or moſt tender vegetable ſubſtance, even a leaf, would not be injured by *ſuch a diſſolution.* Now as ice is *harder* than plants, &c. this is a plain inſtance that, according to the preſent courſe of nature, one and the ſame Agent may diſſolve a hard and firm body, even of great extent and magnitude, without injuring thoſe that are ſmaller, of a finer and more delicate conſtruction. Nay, what may be thought more to the purpoſe, it is well known that, in caſe of lightning, the action of light will penetrate, tear aſunder, and diſſolve the parts of the hardeſt and moſt ſolid bodies, without injuring thoſe of a more ſoft and pliable texture, though it has had a free paſſage through them.

And ſuch alſo is the caſe of the *action* of the *air* upon different bodies. Such ſubſtances as naturally admit a free and eaſy paſſage to the air will not be injured by the penetration of that Agent; whereas thoſe that reſiſt it's force, and the more they reſiſt, *i. e.* the ſtronger, firmer, and finer their conſtituent particles are, the more extenſive will the diſſolution be upon the ſeparation of their particles by the permeation of that Agent. And ſuch was the caſe at the time of the Deluge. In order that a way might be opened for the aſcent of the ſubterranean *water* over the ſurface of the earth, we are told, *Gen.* vii. 11. That *the fountains of the great Abyſs were broken up*, i. e. the ſides of thoſe *paſſages* or *cavities*, through which

ſprings

ſprings and *fountains* received their ſupplies in the ante-diluvian earth were widened and thrown open upwards, and by this means the ſhell of the earth, *deſtroyed*, or broken and ſhattered in a vaſt number of places. But in order that the earth might be *diſſolved* (and the evidence both of the *deſtruction* and *diſſolution* remain to all future generations) we are told, *ver.* 11. (ſee p. 69. of this treatiſe) that *the paſſages of the airs were* alſo *opened*; *i. e.* the ſmaller cracks and crevices in the ſtrata of ſtone, &c. through which *air only* can paſs, were *opened* and diſtended, and the air paſſed freely through every pore and between every atom of ſtone, &c. and ſo the whole earth was really *diſſolved* or reduced to it's original, *fluid*, chaotic ſtate. That the air has a free paſſage through the cracks and pores of moſt ſorts of ſtone, no one will deny, and that it can paſs through all, and even the hardeſt of metals, is well known to thoſe who are acquainted with the nature of theſe bodies. If for inſtance (to mention but one experiment, which may illuſtrate the ſubject I am upon in other reſpects) iron or copper be diſſolved by aqua fortis, a prodigious quantity of air-bubbles ariſe from the decompoſition of the metals, and if this experiment be performed under an exhauſted receiver, the appearance of the air-bubbles is greatly increaſed: and that this air was included in the pores of the metal, and ſet at liberty by the diſſolution of the metallic bodies, is evident from hence, becauſe aqua fortis by it's ſelf will yield no ſuch appearance under the air-pump. Now if we ſuppoſe the pores of all mineral and metallic

metallic bodies to be opened wider than they are naturally, and even ſo far, or extenſively, as that the air ſhould paſs freely between every atom of ſtone, &c. how would this injure or hurt the parts of a *plant* or *animal?* The air had a free and eaſy paſſage through them before, much freer than it had through any ſort of ſtone or metal; and therefore ſuch an execution as this againſt the *ſolid body* of the earth would not affect them; not to mention they were *not intended* to be in the *execution.*

Besides; the *texture* of plants and animals would greatly tend to their preſervation. It is well known that they conſiſt of *fibres* or *ſtringy parts*, which are complicated, twiſted, and tied together; and theſe fibres conſtitute the ſides of veſſels or tubes through which not only air but a much groſſer fluid [the ſap in vegetables, blood, &c. in animals] together with that paſs moſt freely. But the parts of ſtone have no ſuch tie or connection, or any ſuch eaſy, regular channels for the admiſſion and permiſſion of air: their conſtituent principles ſeem to be joined together only by a juxta-poſition or application of plane or ſpherical ſurfaces one to another: whereas the primogenial parts of plants and animals, by the ſtrict union and complicated toughneſs of theſe bodies, are in all probability linked together in a great variety of directions.

To all which conſiderations we may add that plants and animals are ſo ſmall and light in themſelves, and ſo eaſily ſuſceptible of motion any way, eſpecially when ſwimming in a fluid that could bouy

buoy them up (as was the caſe at the time of the deluge) that they would make no reſiſtance to the force of the agents (the *wind* and the *water*) that diſſolved the *ſolid* and *reſiſting* body of the earth, but would be readily driven, this way or that, as the currents of each conveyed them. So that though plants and animals, with regard to what we call the *Life* of them, would be deſtroyed, at leaſt thoſe that remained immerſed in the earth during the deluge, yet their parts would not be *diſſolved*, or their texture reduced to atoms; for the *ſmallneſs*, *poroſity*, *pliability*, and *toughneſs* of their parts would all conſpire towards preſerving them during the moſt violent effects of that cataſtrophe.

FOURTHLY.

HAVING thus proved that all the ſolid ſtructure of the earth has been diſſolved, and the diſſolved parts thereof aſſumed up into, and ſupported by, a large ſphere of water;

I AM now to ſhew, *that all this diſſolved matter, together with the animal and vegetable bodies incloſed within it, ſubſided again, and formed the preſent ſolid ſtrata of the earth.*

I HAVE obſerved already (p. 243.) that there is ſuch a cloſe Connection between the ſeveral parts of the Subject I have been treating, or the Heads I have been naturally led to divide it into, that very often one and the ſame argument would prove ſeveral of theſe heads; and ſo it has come to paſs that the diſcuſſion of the former articles of

this Section has in a manner exhauſted this laſt. For, in ſhort, this laſt depends entirely upon the truth of the Caſe as repreſented in the former. All the arguments that I have there brought in proof of the *Flood*, the *Diſſolution*, &c. were entirely taken from the *preſent ſtate of the earth*. If therefore the foundation, on which thoſe arguments were built, was found, or the ſtate of the Earth juſtly given, little more need be ſaid in this place. And in order that the reader ſhould not rely barely upon my teſtimony, I have ſubjoined, under each of the former articles, the teſtimonies of a variety of authors, who lived in different times, and in very diſtant places: ſo that, in a manner, the voice of all mankind and the face of the whole earth ſpeak the truth of what I have endeavoured to prove.

" WHAT weight theſe teſtimonies ought to have (to ſpeak in the words of the celebrated Author of *Revelation examined with Candour*) the reader will beſt judge:—Teſtimonies ſo numerous, ſo various, ſo diſconcerted, and yet ſo connected, is it poſſible that they can deceive? Could all nations conſpire with all nations, and all ages with all ages, to impoſe upon themſelves and their poſterity? Could the religion of the true GOD, and the religion of the *Syrian* goddeſs! the *Jews*, and the Heathens that hated them! *Moſes* and *Melo* his enemy! tradition conſpire with hiſtory, and hiſtory with mythology! men of all characters, complexions, conditions, and perſuaſions! *Plutarch* with *Beroſus*, *Benjamin* the *Jew* with *Chryſoſtom*, and *Lucian* with both! *Plato* with

with *Pliny*, and *Dio* with *Falconerius!* the imaginations of poets, and the experiments of naturaliſts! antiquity, poetry, philoſophy, and philology! wiſdom, and folly! truth, and fiction! regions unknown to one another! and regions that never heard of one another! the *Greeks*, and the *Hottentots!* the *Perſians*, and the *Banians! Aſia*, with the iſles of the *Gentiles!* and *America* with both! all conſpire to eſtabliſh one univerſal deluſion!—And ALL NATURE join in the atteſtation; produce all her animals, and all her vegetables, all her heights, and all her depths, her mountains, her vales, her levels, to vouch *one univerſal lye*, with all the IRRESISTIBLE EVIDENCE OF TRUTH?"

SURELY thoſe, who ſee not the Force of the Evidence in this particular, muſt wilfully ſhut their eyes againſt the truth; and may juſtly be characteriſed with a ſet of people (if they are not themſelves *the very people)* ſpoken of by St. *Peter*,[o] —*In the* LAST DAYS *ſhall come* SCOFFERS *walking after their own luſts, and ſaying, where is the promiſe of his* (Chriſt's) *Coming? for* ſince [or as it ſhould be rendered, *except that* [p]] *the fathers fell aſleep*, [*ſave only*, that our fathers or all the men that have lived upon the earth are dead, and others now live in their ſtead] *all things continue as they were from the beginning of the Creation*; i.e. there hath been no material alteration in heaven or earth that can evidence the Interpoſition of Providence in the affairs of men, either to

[o] 2 Epiſt. iii. 3.
[p] See HAMMOND on the text.

puniſh the wicked or reward the good, and therefore we may do as we pleaſe, *walk after our own luſts*, &c. *For this* (continues the Apoſtle) *they are* WILLINGLY IGNORANT OF, *That by the Word of* GOD *the heavens were of old, and the earth ſtanding out of the water and in the water; whereby the World that then was, being overflowed with water, periſhed:* that is, *the Eyes of their underſtandings* are ſo blinded by a wilful purſuit after their *paſſions* and *luſts* that they cannot ſee, or will not acknowledge, (if they do) the plaineſt truths in Nature; they will not own, what all the world beſides confeſſeth, what all ages have maintained, what is faithfully recorded in the written word of GOD, and what is engraven in the deepeſt characters all over the face of the earth, and what they may have (which infidels ſo often demand) *ocular demonſtration* of the truth of, *viz.* THAT THERE HAS BEEN AN UNIVERSAL DELUGE, and that the *Threatning* pronounced by GOD four thouſand years ago on a *wicked race of mortals* was really accompliſhed, viz. *And* GOD *ſaid unto Noah, the end of all fleſh is come before me, for the earth is filled with violence through them, and I will deſtroy them,*[q] i. e. the inhabitants, *with the earth* that bare them; and which through it's abundant fertility (abuſed by them) furniſhes proviſion only for their luſts, luxury, and idolatry.

THE Evidences of this Deſtruction are ſuch, that the very bodies or bones of the perſons thus deſtroyed, together with the animal creation that periſhed

[q] *Gen.* vi. 13.

periſhed with them, are ſtill remaining as ſtanding, ſtriking Monuments of this execution of Divine Wrath upon a wicked world, and are to be ſeen in every part of the Earth, not only upon the ſurface, but in the very ſolid ſubſtance of it, not only in vallies and dales, but upon the tops of the higheſt mountains and eminences, and buried alſo to the greateſt depths that human art or labour has ever penetrated.

CERTAIN then it is that this whole earth has been deſtroyed, all the ſolid ſtructure of it unhinged, broken to pieces, and reduced to it's original looſe chaotic ſtate, and afterwards formed anew into it's preſent ſolid, beautiful, and convenient ſhape. Effects theſe ſo great! that they could never have happened of themſelves, never have been the performance of blind inanimate matter. Matter cannot even deſtroy itſelf, much leſs, when deſtroyed, form itſelf anew. Theſe tranſactions therefore muſt have been effected by a Being ſuperior to all the Powers of Nature: and they carry in themſelves ſuch evident marks of *Wiſdom*, *Power*, *Goodneſs* and *Juſtice*, that they not only prove that there is a GOD, but that HE GOVERNS the World,—that *ſin* is his greateſt deteſtation, and *a life of faith* and *righteouſneſs* the only recommendation to his favour, *Heb.* xi. 7. *By faith Noah being warned of God of things not ſeen as yet, moved with fear, prepared an ark to the ſaving of his houſe; by the which he condemned the world, and became heir of the righteouſneſs which is by faith.*

THUS does the Book of Nature lead to the Book of GOD, and the one bears witneſs to the truth of the other, not only with reſpect to it's *philoſophy* but even it's *divinity*.

I COULD wiſh therefore that all ſearchers into nature, eſpecially thoſe who examine the ſubterranean kingdom, and are ſo anxious, and at ſo much pains, expence, and difficulty to procure the productions thereof, would conſider *theſe two particulars*, and make a right uſe of their labours and ſtudies.

IT is at preſent too faſhionable a cuſtom with foſſiliſts to admire the external beauties of their curioſities, and to place them with great care and art in their cabinets, with no other view than to exhibit them to the ignorant as a raree-ſhow. Poor amuſement to a rational mind! an employment quite unworthy the dignity of a philoſopher, who may draw ſo many and ſuch advantageous truths from his ſubterranean reſearches.

IF the medaliſt can creep but half way to the time of the Deluge, and can prove from his collection the exiſtence of a *Cæſar* or *Alexander*, he thinks he riſes high in antiquity, and has made ſome noble diſcovery. But how vaſtly beneath the foſſiliſt does he fall? I have fully ſhewn, that all the works of the artificers in *braſs*, *iron*, *ſtone*, &c. were *diſſolved* at the time of the Deluge, and that the knowledge of their arts were not recovered, or at leaſt in general applied, 'till long after the flood, p. 135. So that the medaliſt muſt be content to make his obſervations upon things and impreſſions, that had not an exiſtence when

the

the imprimatures of the ante-diluvian animal and vegetable bodies were formed in the ſolid rock all over the earth.

NEITHER do the *foſſil reliquiæ* of plants and animals by any means yield in elegancy and exactneſs to the medalic inſignatures; nay they far exceed them, for they exhibit not only the preciſe figure and due ſize, but the very bodies themſelves are moſt exquiſitly preſerved: whereas in medalic impreſſions the form is contracted and the likeneſs imagined.—" Theſe foſſil bodies then (ſays the author of *Spectacle de la Nature*, Vol. III. p. 415.) ſo ſeemingly uſeleſs, do ſpeak demonſtration to our ſenſes, and are a language which is underſtood by the moſt common capacities, having been appointed by Providence as ſo many ſtanding monuments of the moſt remarkable of all tranſactions, and are with regard to the *hiſtory* of *Moſes* the ſame as *medals* to the *Roman hiſtory*." *Voila* (ſays another *French* writer, *Hiſt. de l'Acad. Roy.* 1710. p. 28.) *des nouvelles eſpeces des medailles, dont les dates ſont & ſans comparaiſon plus anciennes, & plus importantes, & plus ſures, que celles des toutes les medailles Grecques & Romaines.*

AGAIN; certain it is that the works of GOD are contrived and executed by the utmoſt wiſdom, and for the moſt noble and uſeful purpoſes. And yet if we look into the earth, we ſhall ſee a ſtrange diſtribution of things, an appearance quite contrary to all order and regularity, propriety or utility. If we viſit the tops of the higheſt mountains, and examine the ſtate of things juſt under

the turf, at leaſt in ſuch as are boggy and moraſſy, we ſhall find a vaſt variety of periſhed vegetables, of ſuch kinds or ſpecies as at preſent are not known (in their natural ſtate) to the inhabitants of the countries where they are diſcovered. If we examine the inſide of the earth, inſtead of finding things peculiar to the land or it's internal conſtitution, we ſhall there diſcover, even at the loweſt depths, *the ſpoils of the ocean* in great abundance, together with a vaſt variety of *animal* and *vegetable bodies* that can live and grow only upon the ſurface of the earth. And what is farther remarkable, in many places, only *parts* of theſe bodies, trunks of trees and leaves of plants without roots or branches, teeth of fiſhes without jaws, and bones without any bodies to ſupport them; and all theſe ſo cloſely fixed to and completely circumſcribed by the ſolid rock, as to ſhew that they could never have been of any uſe to any creature where they are found, neither could they ever have increaſed to complete forms. Then as for thoſe that are complete in their ſhapes, and carry evident marks of having been once *living creatures*, it is equally ſurprizing for what end or purpoſe they could be laid there, or why a ſet of beings, that invariably purſue the will of their creator, or could not poſſibly offend him, ſhould be deſtroyed in ſuch amazing multitudes, that ſeveral whole ſpecies ſeem to have been buried alive in the earth. Theſe ſtrange, ſtriking phænomena certainly deſerve the notice and call for the examination, not only of the *philoſopher*, but even of the *divine*.

Now

Now it is an allowed caſe that *nature*, i. e. the *Author of nature*, *does nothing in vain*. It therefore behoves the philoſopher to ſhew this, and to ſolve all appearances to the contrary. And, in the article under conſideration, it appears, I hope, from the foregoing treatiſe, that nothing but the ſuppoſition of the *univerſal Deluge* can anſwer theſe phænomena, and that That in every reſpect is equivalent to them; and therefore we may fairly conclude the reality of ſuch an event.

And with regard to *divinity*; it is a certain truth, that the *natural* world never ſuffered, unleſs the *ſpiritual* or *moral* had firſt offended. It cannot be ſuppoſed that God would fall out with ſenſeleſs inanimate matter, that operates mechanically, or puniſh the brute creation on their own account, that unvariably purſue the rules and inſtincts he has preſcribed them. If therefore either of theſe ſuffer, or the ſtate and condition of either be altered, at leaſt from better to worſe, it muſt be on account of that Being, for whoſe ſake they were at firſt made, and for whoſe welfare they are ſtill continued in exiſtence. And when they can be no longer of any ſervice to man (for whoſe uſe they were originally formed) it would be needleſs to preſerve them alive. If therefore man, or the whole ſpecies of the human race, except a few righteous, ſhould in ſuch a manner offend their Maker as to deſerve a total extirpation; it would be but requiſite that the brute creation ſhould periſh together with them, or at leaſt the far greater part of them, leſt at the renewal of the world the ſmall remnant of the human race

ſhould

ſhould be overcome by thoſe very creatures that were made for their benefit. And the *manner* in which they were deſtroyed, and the *diſtribution* of their bodies or bones after, indicate the *wiſdom* and *goodneſs* of that GOD, who *in judgment always remembers mercy*; for by burying of them in the earth, eſpecially in the *moſt ſolid* parts (which are of the greateſt ſervice to man, and therefore are daily dug and brought up to light) they are, and will remain, to each ſucceeding race of men as an evident proof of the truth of the deſtruction and of the wrath of GOD againſt a world of ſinners; ſo that *though dead* they ſtill *ſpeak* in the lively oracles of GOD and in the book of Nature.

THE certainty that *this globe* has been deſtroyed *by a flood of water* may ſerve, not only as an argument againſt the *eternity* and *immutability of nature*, but alſo to convince us of another *ſcriptural* truth, that it will be deſtroyed *by fire*, 2 *Pet.* iii. 10. To an undiſcerning eye there are as few marks of *fire* in the earth, as there were of a *ſubterranean Abyſs of waters* to the ante-diluvian ſcoffers. And the general conflagration ſeems at preſent as incredible, and is as much ridiculed, as the Deluge was before it happened. And though GOD could conſume the whole world, if he pleaſed, by the blaſt of his mouth, yet he hath ſo conſtructed the earth, and ſtored it with ſuch cumbuſtible materials, as coal, ſulphur, bitumen, *&c.* as to afford us ſome kind of pre-ſignification of it's final deſtruction by fire. And this event ſeemed ſo probable in the opinion of an heathen philoſopher,

philoſopher, who had carefully examined the internal ſtructure of the earth, that *he wondered it had not come to paſs ages ago*; for *Pliny* in his ſecond book of *Nat. Hiſtory*, chap. cvi. cvii. after having given an account of ſome fiery mountains and other parts of the earth that are the ſeats and ſources of fire, makes this reflection: "Seeing, then, this element is ſo fruitful that it brings forth itſelf, and multiplies and increaſes from the leaſt ſparks, what are we to expect from ſo many fires already kindled on the earth? How does nature feed and ſatisfy ſo devouring an element, and ſuch a great voracity throughout all the world, without loſs or diminution of herſelf? Add to theſe fires we have mentioned the ſtars and the great ſun; then all the fires made for human uſes; fire in ſtones, in wood, in clouds, and in thunder. *So that it exceeds all miracles, that one day ſhould paſs without ſetting the whole world on fire*; *excedit profecto omnia miracula, ullum diem fuiſſe quo non cuncta conflagrarent.*"

But why need I mention *one* or *two* ſcripture philoſophical truths only, as verified by *the natural ſtate* of the earth? I have already ſhewn, that the *Moſaic account* of *the manner in which the whole earth was at firſt formed, together with the powers of the heavens or airs, and the manner in which it was deſtroyed and reformed at the time of the Deluge*, are philoſophically juſt and literally true: and therefore that the biblical philoſophy is ſtrictly conſiſtent with nature. And ſeveral reaſons may be given why it ought to be ſo.

Firſt,

First, Becauſe when *Moſes* wrote, the *world* was *wholly given to idolatry*, and this idolatry conſiſted in the worſhip of the heavens, earth, *&c.* —*the ſun, the moon, and the ſtars, and all the hoſt of them*, (ſee p. 6.) and of no other god or gods (except the true) do we ever read throughout the Old Teſtament. Now the moſt likely and effectual way to deſtroy this idolatry would be, to *reveal a true ſyſtem of nature*—to declare that the heavens were *created* (and ſo not GOD)—to ſhew how, ſtep by ſtep, they were *formed* into *a machine for the ſervice of man*; and therefore that man ought not to be ſubſervient or pay adoration to them; and to omit declaring this, would be to leave and encourage men in their idolatries: eſpecially, if any account of nature was given in the Bible; and as ſuch is undeniably laid down, principally, in the firſt chapter of *Geneſis*, that muſt undoubtedly be true.

Secondly, Beſides, was not the Bible written for *this* age, as well as thoſe in which the writers of it lived? Nay, was it not written *for*, and therefore is to continue *to*, *all* ages?—Did not the Spirit of truth (in whoſe ſight *a thouſand years are but as one day*) very well know, that certain ſelf-ſufficient mortals would riſe up (after his revelation was *delivered* and *ſealed*) contradict his word, diſpute his philoſophy, and preſume to give a ſyſtem of nature out of their own brains; when it was as much, or rather more impracticable for them to give the true one, than it would be for a man—who had never ſeen a watch, or any machine like it, and was utterly ignorant of the

movements

movements within—to account for the motion of the hand, in it's regular circuit, round the dial-plate? Did not the Spirit of truth, I ſay, know all this? And would not his goodneſs prompt him, and his veracity induce him, to reveal a true ſyſtem of nature; that thoſe who had humility to own that GOD alone could give an account of his works, and were willing to ſearch his word for that inſtruction, ſhould there find the ineſtimable treaſure? And as GOD has vouchſafed to give an account, who will preſume to affirm that that account is untrue, or accommodated to the current, though falſe, opinions of the times?

Thirdly, "To ſuppoſe the Divine Being (ſays Mr. *Pike* in his *Philoſophia Sacra*, p. 12.) to conform himſelf in his word to bare outward appearances, or to the falſe apprehenſions of the vulgar, is ſuch a ſuppoſition as we will not admit in any other caſe. The alluſions and references of ſcripture to *hiſtory* or *geography* and the like we maintain to be juſt and exactly true, and look upon ourſelves as bound to believe and maintain the *hiſtory* as well as the *theology* of revelation; and why then ſhould we not for the ſame reaſon account ourſelves obliged to maintain, that there is no miſtake or miſrepreſentation in it's deſcriptions of and references to *natural things?*"

Fourthly, "There are many philoſophical paſſages, that cannot be regularly explained as conformed to outward appearance, or the opinions of men. Witneſs the *Moſaic* account of the creation and formation of all things. Can any one affirm that the firſt chapter of the Bible is built upon

upon a falſe hypotheſis, or accomodated to vulgar apprehenſions? And if it be not true either in appearance, or in reality, I ſee not how it can be true in any reſpect."

Fifthly, " We muſt not ſuppoſe the word of God to ſpeak falſe in any caſe whatſoever. *It's hiſtory*, *it's chronology*, and *it's philoſophy* muſt be in fact as true as *it's theology*. If we ſuppoſe any part of the divine word to be erroneous, this ſo far ſhakes the authority of all the reſt. And as God knows all things perfectly, we muſt believe him the fitteſt to give us an account of his *works* as well as of his *nature*."

Sixthly, " There is a *neceſſary connection* between the knowledge of *natural* and *ſpiritual* things; ſince ſcripture conſtantly, or at leaſt very frequently, refers our thoughts to natural ideas, in order to illuſtrate ſpiritual truths. And for this reaſon it appears to be of ſome conſiderable importance, that the natural ideas referred to be ſtrictly juſt and true, in order to be a proper foundation for a right conception and repreſentation of divine matters."

Or, as Mr. *Spearman* (in his *Enquiry after Philoſophy and Theology*, p. 254.) has moſt judiciouſly ſtated this caſe: " When the ſenſes have acted upon any material natural object, what they take in and retain by that action is the *inward ſenſe* or *idea* of the thing; and the knowledge we gain by ſuch repeated acts of the ſenſes upon nature and her operations is *natural knowledge* or *phyſics*. When we make uſe of theſe natural and acquired ideas to help us to ideas of ſpiritual things,

things, the knowledge we, by theſe means, gain of GOD and his operations is *ſuper-natural knowledge* or *metaphyſics*: and ſo by *things* that are *viſible* within the reach of our ſenſes, and *which we can underſtand*, we are led to the knowledge of *things which are inviſible*, without the reach of our ſenſes, and which we could not otherwiſe underſtand.[r] It is agreed, that we have no innate ideas; and that nothing can be in the underſtanding but what comes in by the ſenſes. We therefore either can have no ideas of GOD and ſpiritual things, or we muſt take them in by our ſenſes. But our ſenſes cannot act immediately upon ſpiritual objects, becauſe they are not the objects of our ſenſes; therefore we muſt have our ideas of ſpiritual and inviſible things from natural and viſible things. But natural and viſible things can give us no ideas of ſpiritual and inviſible things, unleſs they bear *ſome analogy* to them, are the *ſimulacra* or *images of them*. And if they be the images of them, they muſt have been *ſo created* and framed by GOD the Creator, and *to this very end*, and with *this very deſign*: for nothing could be created by infinite wiſdom but with foreknowledge and deſign. And ſince we find in the ſcriptures GOD and ſpiritual things repreſented to us under the ideas and names of viſible and ſenſible

[r] As *Rom.* i. 19. *That which may be known of God is manifeſt among men; for God* himſelf εφανερωσε *hath* ſhewed *it unto them.* [hath *manifeſted* it; for otherwiſe it could never have been known.] Γαρ, *For* [Inaſmuch as] *the inviſible things of him from the creation of the world are clearly ſeen, being underſtood by the things that are made,* [viſibles being made ſubſtitutes for inviſibles] *even his eternal power and Godhead.*

ſenſible things, it is a demonſtration in itſelf that God framed them to repreſent himſelf, and what he pre-intended to reveal of himſelf and his ways to mankind."

So that we may well ſay with *Tully* from *Plato*, *Neceſſe eſt hunc mundum, quem cernimus, ſimulacrum eſſe æternum alicujus æterni. It cannot be but that this world, which is viſible to us, ſhould be a ſtanding type or repreſentation of ſomething eternal.*

So alſo *Milton*,

Earth is the ſhadow of heav'n, the things therein
Each other like, more than on earth is thought.

I SHALL leave the pious reader to purſue *this thought* (as I want words to expreſs the *height, length, breadth, and depth* of it)—to the conſideration of *the new heavens* and *new earth* (ſpoken of by St. *Peter* 2 Ep. chap. iii.) *wherein dwelleth righteouſneſs*;—to *the great city* (Revel. xxi.) *the holy Jeruſalem that is to deſcend out of heaven from* God, *having the glory of* God; *whoſe light is like unto a ſtone moſt precious, even like a jaſper ſtone, clear as cryſtal*; which *hath a wall great and high, and twelve gates, and the wall of the city hath twelve foundations.* And *the city lieth four-ſquare; the length, and the breadth, and the height of it are equal.* And *the foundations of the wall of the city are garniſhed with all manner of* precious ſtones. *The firſt foundation was* jaſper; *the ſecond*, ſapphire; *the third*, a chalcedony; *the fourth*, an emerald; *the fifth*, ſardonyx; *the ſixth*, ſardius;

the

the ſeventh, a chryſolite; *the eighth*, a beryl; *the ninth*, a topaz; *the tenth*, a chryſopraſus; *the eleventh*, a jacinct; *the twelfth*, an amethyſt. *And the twelve gates were* twelve pearls; *every ſeveral gate was of one pearl:* and *the ſtreet of the city was* pure gold, *as it were tranſparent* glaſs. *And I ſaw no temple therein: for the Lord God Almighty and the Lamb are the temple of it. And the city had no need of the ſun, neither of the moon to ſhine in it: for the glory of God did lighten it, and the Lamb is the light thereof.*

BEFORE I quite conclude this treatiſe, I ſhall take the liberty to preſent the reader with a poetical paraphraſe of the 104th *Pſalm*, as compoſed by my Father from the true ſenſe of the Original; ſince that Pſalm contains, among other things, a deſcription of the *two principal Particulars* diſcuſſed in this Tract, viz. *the Manner in which the Earth was at firſt formed*, and *the Manner in which it was deſtroyed and formed anew at the time of the Deluge.*

The Hundred and Fourth PSALM

PARAPHRASED

By the late Rev. Mr. A. S. CATCOTT.

EXERT thy reas'ning pow'rs, my vital frame,
And grateful praiſe the great JEHOVAH's name;
Hail thou who ART! reſiſtleſs in thy might,
Array'd in glory and majeſtic light!

As a wide tent, extended over-head,
Thy forming hands the vaſt expanſe out-ſpred,
Whoſe binding force the fluid orb reſtrain'd,
And reach'd thoſe atoms the looſe maſs contain'd.
Whence the firm ſtrata, which the globe compoſe,
Each over each in mounting ſtories roſe.
Onward it mov'd, impell'd by grains of air;
The wings of winds the floating orb upbare.
With * double impulſe puſh'd the *Spirit*'s force,
And *Light primæval* ſteer'd it in it's courſe.

On

* As רוחות, being in the *plural* number, indicates. The *Wind* or *Spirit* and the *Light* or a *Flame of Fire* were the *Agents* or *Miniſters*

On th' *Airs*, as baſes, he machin'd the ſphere,
And firmly bid the ſolid parts cohere.
As yet the ſhell beneath the waters lay,
And future mountains had not ſeen the day.
At thy command th' affrighted waters fled,
And ſought tumultuous their appointed bed.
O'er hills they roll'd, and follow'd the deſcent,
Deep channels tore, and the ſplit vallies rent.
There lodg'd, in earth's capacious womb, they reſt,
By the ſtrong heav'n's expanſive pow'r compreſs'd.
Their bound'ries ſtill their raging waves confine,
Bound'ries unmov'd by any pow'r but thine.
Hence rais'd in ſteam, they work their ſecret way,
In lowly vales through openings meet the day,
Or trickling 'twixt the winding mountains ſtray.
Here haunt the beaſts, and find a cool retreat,
And parch'd wild-aſſes quench their thirſty heat.
In neighb'ring trees, amidſt the leafy ſprays,
Birds build their neſts, and chaunt their chearful lays.
The ouzing ſprings bedew the moſſy hills,
And thence glide down the fertile vale in rills:

Hence

Miniſters that God made uſe of in *garniſhing the Heavens* and in *forming the Earth*, as I have ſhewn p. 52, &c. of this Tract. As the *Works of Nature* are here ſpoken of, it is certainly more natural to ſuppoſe the *material Angels* or *Agents* are here meant than *immaterial* and *ſpiritual Beings*.

Hence new in ſtrength the ſaturated ſoil
With verdant graſs ſupports the cattle's toil;
With various herbs for human uſe is crown'd,
Or yellow harveſts load the fruitful ground.
Hence riſe th' effects of induſtry and art;
Hence bread is form'd, the ſtrength'ner of the heart.
From ſwelling grapes the foaming wine is preſs'd,
Diffuſing gladneſs o'er the penſive breaſt.
Oil with youth's bloom renews each fading grace,
And ſheds freſh glories o'er the beauteous face.
Trees, ſacred emblems, and once *Eden*'s pride,
From the ſame ſtorehouſe are with ſap ſupply'd;
Cedars, which *Lebanon*'s high ſummits grace,
Set there by God, † coeval with their place:
Lodg'd in whoſe branches fowls ſecurely reſt,
And tow'ring firs which yield the ſtork a neſt.
On higheſt hills the ſhy Chamois are found,
And delving conies bore the rocky ground.
The moon's fair light (her orb by ſtated force
Impell'd) determines periods by it's courſe:
The ſun's more glorious runs it's known career,
And gilds by turns each ſhifting hemiſphere.
The light goes off, and night ſucceeds the day;
The beaſts come forth, and proul in ſearch of prey.

With

† *i.e.* Set there *by Nature*, or *the Author of Nature*, in oppoſition to thoſe *planted* by *the Art of Man*.

With hunger pinch'd the whelps of lions roar,
And from their Maker's hand their meat implore.
Again the light irradiates on the ſphere;
The beaſts retire to dens, and diſappear.
Men iſſuing forth their daily toils attend,
'Till ev'ning-twilight bids their labours end.

O great JEHOVAH! dreadful, glorious name!
What wonders fill this univerſal frame!
In ALL thy ſovereign wiſdom ſhines expreſs'd;
But Thou profuſely kind this globe haſt bleſs'd:
How vaſt the ſea! magnificently ſpred!
Of creatures numberleſs the ſpacious bed!
O'er the wide level ſhips purſue their way,
And huge ſea-monſters toſs the deep in play.
All wait on Thee, and Thou ſupremely good
In proper ſeaſon giv'ſt to all their food:
Thou giv'ſt, they take, thine hand thou open'ſt wide,
Whence all, that live, with plenty are ſupply'd.

When once from earth thy preſence diſappear'd,
Man's impious race impending vengeance fear'd.
The world's great courſe was chang'd; no more ſup-
With vital ſpirit, all expir'd, and dy'd. [ply'd
Ev'n nature's adamantine chain was loos'd,
And things to their primæval ſtate reduc'd.

Soon

Soon as Thou bad'ſt the *Spirit* work again,
And, as at firſt, the fluid orb reſtrain,
New forms appear'd reſemblant of the old,
And earth was cloath'd with vegetable mold.

But he whoſe emblem GLORY is, whoſe name
JEHOVAH is, for ever IS the ſame;
Whene'er his works propitious he ſurveys,
Nature proceeds ſucceſsful in her ways;
But when in wrath his flaming bolts are hurl'd,
The mountains ſmoke, and tremblings ſhake the world.

So long as life ſupports this breathing frame,
I'll ſing my SAVIOUR, great JEHOVAH's name.
When thought of Him my raviſh'd ſoul employs,
I feel a foretaſte of immortal joys.
While ſhort on earth the pleaſures are that flow
From ſin, and follow'd by eternal woe:
My vital frame the great JEHOVAH bleſs,
Adore his goodneſs, and his pow'r confeſs!

FINIS.

ERRATA.

P. 127, l. 16, for *Temple* r. *Tabernacle*. P. 307, l. 14, *præ ſe ferant*.
P. 394, l. 29, for 70, r. 70.

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